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Developing a Housing Program in a Southern City*

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UNTIL recent years, the housing activities of the Department of Health of the City of Memphis, outside of the efforts made to get houses connected to recently extended public sewer and water lines, consisted largely of efforts to keep down complaints of citizens by concentrating inspection service in areas where complaints were coming from and on items complained of. Work was being done at the direction of the complaining public and not according to a plan or program designed to meet a public health problem. No permanent accessible records were kept and this prevented any analysis or study of definite data to aid in the formulation of an intelligent housing program.

Beginning in 1929, and continuing to the present date, permanent records have been kept of housing conditions found at all homes or premises inspected. These are filed by wards and by address, and where special problems involving complaints, letters or records of special investigations are accumulated on one house, an envelope is used to keep the records together and in the same housing file.

At first an intensive drive over several years was made to enforce compliance with existing housing ordinances and a great deal of new construction and repair work was accomplished, especially in the way of securing at least 1 toilet to each 2 families, water and sink within 25 feet of each house; screening and mosquito proofing, and, the demolition of dilapidated houses. It was noticed that such supposed improvements were doubtful gains and at the most might be considered temporary expedients. In fact, it appears now that the more outdoor communal toilets are installed, the more insanitary toilets there are to supervise. Communal conveniences are neglected, abused, and in many instances stolen or destroyed bit by bit, resulting in insanitary conditions and a return to the original condition within a year or two.

It has been increasingly evident to all of those concerned with this problem in Memphis that our ordinances

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are out of date, and were drawn before the transmission of some diseases was understood.

We believe that good housing is an essential foundation on which to build a well rounded health program and, as the late Edgar Sydenstricker said,[1] although the

> . . . precise relationship of housing to health is not fully known there is no question that certain types of housing are conducive to the spread of infectious diseases and tend to break down the resistance of inmates to other diseases. Slum clearance in our cities and better housing for persons of low incomes wherever they may live, are clearly preventive measures which are in the category of public health functions.

In the larger cities where so much needs to be done, the health department may not actually be concerned with the administration of a housing program, although it will certainly be called on to investigate complaints in regard to poor housing conditions and will be in a position to make its influence felt in trying to work out a solution. In many cities the health department may be the logical agency to take the prime interest in, and to define to a large extent the housing problem and undertake its solution.

As expressed by J. Scott MacNutt [2]:

> Little has been done by health officials in this country to approach the housing problem in its deeper conditions. The reason for this is clear. Public health is only one aspect of a large problem which must be attacked coöperatively from several directions. Safety, economy, and morality make it a sociological problem as well as a merely sanitary one. The factor of personal hygiene is so great that education must play a large part. Nevertheless, housing will always remain one of the prime influences on health, to which every health department should pay as much attention as is consistent with its other duties. There is perhaps no other field in which preventive measures should look so far ahead and should so anticipate the evils of growing communities. Such evils are far more easily prevented than cured.

The larger southern cities, although having had safe public water supplies for years have higher typhoid rates than found in any other section of the country. In smaller cities in the South with populations of less than 100,000 it is not uncommon to have rates of from 10 to 25 deaths per 100,000 from typhoid fever.

In a previous paper,[3] based on a survey made in 1934, in Memphis, "Typhoid fever rates for the colored showed a direct relation to specific slum areas grouped according to percentage of living units without private toilets." Has the outdoor communal toilet, whether a pit or open privy as in some towns or cities, or an outdoor communal toilet connected to a sewer system as in Memphis, kept typhoid fever and other intestinal disease rates from coming down as rapidly as would be expected from results elsewhere after the providing of safe public water supplies?

Also, "Typhoid fever rates for the whites living in specific slum areas showed a direct relation when grouped according to typhoid fever rates for the colored race in those areas." This emphasizes one of the reasons advanced by many for improving housing conditions of slum dwellers for the protection of those who live nearby or who come into contact with them as servants at work, or in the home.

The filth-borne diseases as well as the insect-borne group invite serious thought and study by public health workers in the South to the problem of housing the low wage earner.

Other very pertinent facts were brought out in the same survey.

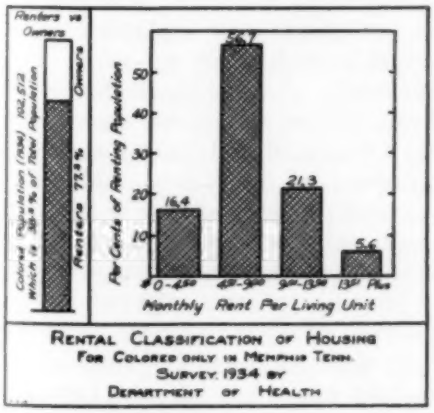
DILAPIDATED DWELLINGS

Eight and six-tenths per cent of all of the dwellings in the city were dilapidated to the point that it was impractical to attempt patching to meet minimum standards of decent and sanitary

dwellings. Fourteen per cent of the dwellings occupied by colored people were dilapidated, against 2 per cent of those occupied by white people. In one ward in the center of the slum district, 63 per cent of the dwellings occupied by colored were in a dilapidated condition. In another ward occupied by a high percentage of white people, 26 per cent of the houses in which they live were dilapidated. These figures indicate the run-down, neglected condition of the large areas of dwellings occupied by the low wage earner, particularly among the colored.

POVERTY

Of the white people 21 per cent pay less than $3 per week rent, while among the colored 94 per cent pay less than $3 per week. This rental includes the entire dwelling unit regardless of whether they live in 1, 2, 3, or more rooms. Seventy-three per cent pay less than $9 per month rent for the entire dwelling unit. This emphasizes the contribution that poverty makes to the development of a slum. See Chart I for the classification of the renting colored population of Memphis into 4 rental groups. No attempt will be made to show the exact dividing line between indigents and the group that could be reached with subsidized housing or between the group that could be provided for by private capital (if a housing code were enforced for this group) and those who pay sufficient rent to select houses meeting minimum standards. It does indicate that there are 4 groups requiring different treatment and different problems for solution.



RENTAL CLASSIFICATION OF HOUSING FOR COLORED ONLY IN MEMPHIS TENN. SURVEY 1934 BY DEPARTMENT OF HEALTH

CHART I

INSANITATION

In addition to being dilapidated or in need of major repairs, approximately 70 per cent of the colored dwellings are supplied with the communal toilet or pit privy in the yard, and only 20 per cent have the toilets within living units. Eighty-six per cent of the white population have toilets within the living unit and an additional 3 per cent have the toilet on the back porch, but private to that family; leaving 11 per cent of the white people using communal toilets and pit privies in the yard.

WATER SUPPLY

Sixty-three per cent of the colored used communal hydrants in the yard or on the porch for their water supply, while for the white people, only 4.5 per cent used a communal hydrant in the yard for their supply.

REAR AND ALLEY DWELLINGS

Twenty-one per cent of all the dwellings occupied by colored people were rear or alley dwellings. In 4 wards all of the houses occupied by colored people were in the rear. Ninety-nine per cent of the dwellings, however, occupied by white people face a street.

POPULATION DENSITY

Memphis does not have a high density of population. The average number of persons per acre for the city is 8.6 and the most densely populated ward shows a population of 31 persons per acre. It is understood that in some

of the larger cities, the population per acre will run over 125.

OWNERSHIP

Sixty-seven and one-half per cent of the people of Memphis live in rented homes or units; 77.2 of the colored and 58.7 of the whites.

It is known that a large per cent of the occupant owned homes among the colored in Memphis are of the same type as the rented homes or units.

Many elements, as illustrated in these figures enter into the housing problem. Municipal neglect as indicated by the lack of housing codes is an important factor while poverty and ignorance on the part of the slum dwellers and ignorance and greed of some property owners have contributed to these housing evils mentioned above.

The program of housing for Memphis is developing slowly, but soundly along several lines at this time:

1. The drafting and early adoption of a housing code to prevent the formation or building of new slums by controlling future building and alteration of dwellings.
2. By correcting existing conditions through condemnations and orders for improvements and for proper maintenance in order to bring existing conditions up to a minimum standard. This will be developed systematically with specific areas selected for specific treatment.
3. Through continued study and analysis of existing conditions in the slum areas with a view toward continued planning of an intelligent housing program that will yield the greatest returns on the efforts expended.
4. Serious study of the cost of a minimum standard house or units of housing if built on a large scale in order to determine what steps may be taken for government housing for those families that private capital is not or should not be interested in because of their low earning power and rental limits.

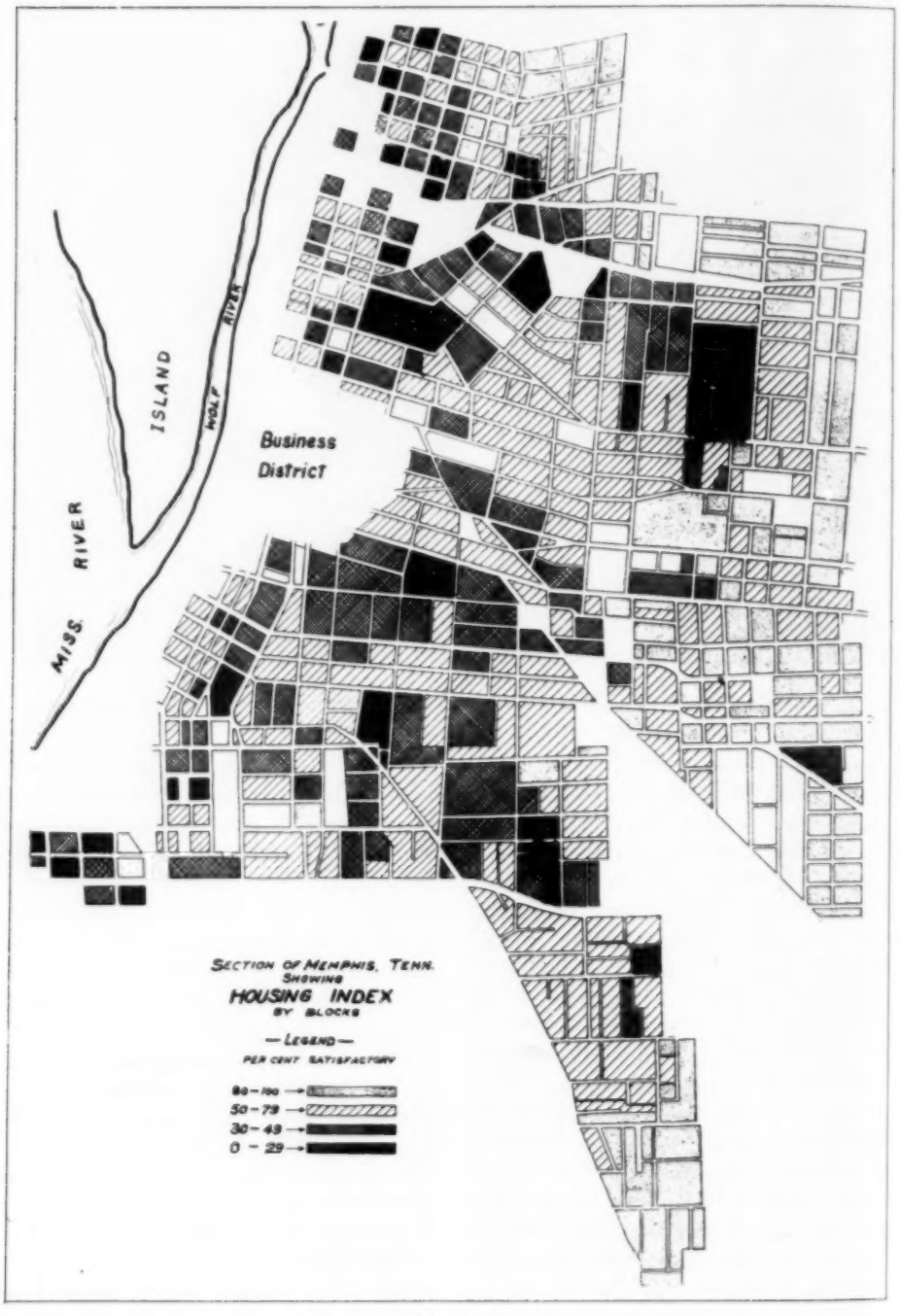
A code for Memphis is now being prepared, in the preparation of which no assistance was available from any of the federal divisions, such as: the P.W.A., the Bureau of Standards of the Department of Commerce, and the Public Health Service. *The Model Housing Code*,[4] by Lawrence Veiller was pointed out by the Bureau of Standards as recommended for use by municipalities of the State of New York, and it seems to be the foundation of most of the housing codes of the country. It has served as the basis for the Memphis Housing Code, which is now undergoing a refining process of comparison with the Building Code, the Zoning Ordinance and the Fire Prevention Ordinance. It is hoped that a comprehensive housing code will be adopted early in 1937 for the City of Memphis. After the adoption of a practical and fundamentally sound housing code, its enforcement is expected to raise a number of difficult administrative problems.

The second of these measures, subsidized housing by the federal government, has already been initiated in Memphis. Two federal housing projects for 1,183 families are already under construction. While the first housing survey was in progress, the Federal Housing Division of the P.W.A. announced that they would accept applications for slum clearance and rebuilding projects with the division putting up 100 per cent of the cost of the project, but the filing of such an application at that time required the securing of more detailed data on specific slum areas to be torn down. An application for a second housing survey was made which was finally approved in an abbreviated form, and the survey was made under the direction of a Housing Commission appointed by the Mayor of Memphis. A systematic accumulation of data was made including a field survey, many photographs, the summarizing of records of deaths, accidents, sickness, crime, juvenile delinquency, traffic accidents, back taxes, supported by expressions of backing from the Civic and Luncheon Clubs, Chamber of Commerce, and

PICTURE 1—Houses for which tenants pay $1.75 a week for the entire living unit

prominent business organizations, individuals, etc. Two most excellent and complete applications were made to the Housing Division of the P.W.A. They received approval and are now under construction. The story of the federal slum clearance projects and the efforts made to make it a reality will not be discussed in this brief outline of the activities of the Housing Division of the Health Department.

According to the housing survey, it appears now that approximately 60 per cent of the renting population of Memphis cannot live in dwellings meeting the federal minimum standards. This statement is based on the fact that 60 per cent of the population pay less than $13.50 a month rent for the entire living unit, which is considerably less than rents being charged by federal housing projects completed elsewhere. A certain per cent of these are able to secure, for this rent, satisfactory houses when judged by the local Health Department minimum housing standards. A large per cent of the colored occupant owned houses are far below the minimum standard of housing and the monthly payments on them are less than $13 a month. It is admitted by many that private capital could organize limited dividend housing corporations, or the equivalent, by pooling the resources of a group of property owners in a completely dilapidated slum area, and furnish sanitary minimum standard housing for a lower income group than is provided for by the federal projects in Memphis. Land in the slum areas is worth very little, being undesirable property for business or industrial development, and because the value of the property depends on the type of housing


MISS. RIVER
ISLAND
WOLF RIVER
Business District
SECTION OF MEMPHIS, TENN. SHOWING
HOUSING INDEX
BY BLOCKS
— LEGEND —
PER CENT SATISFACTORY
80 - 100
50 - 79
30 - 49
0 - 29

MAP I

around it. In addition, in some cases second hand material could be used, and certain standards adopted by the Federal P.W.A. Housing Division, such as the central heating plant, all fireproof material, expensive foundations, etc., might be left out, as well as other savings possibly by private capital which totalled together, may more than offset the subsidy of the government.

Many dwellings can be properly maintained through remodeling and modernizing of plumbing, etc., in order to meet minimum housing standards, and charge less rent than would have to be charged by the federal slum clearance projects. The federal slum clearance projects in Memphis will serve as a stimulus and a demonstration which has already helped to arouse a general interest and support of the housing program in Memphis. Two dilapidated insanitary slum areas have been completely razed to make way for the 2 federal low-cost housing projects.

The natural pick-up in employment and the amount of steady work on the part of the low wage earners which seems to be increasing, will undoubtedly increase the percentage of people who will be able to take advantage of the subsidized federal housing dwellings.

To analyze further the make-up of a slum area, an interesting and original analysis of the slum area of Memphis is being carried on which should be very helpful in working out the administrative procedures for the enforcement of the Housing Code. Briefly, it is an attempt to place a numerical value or rating on each house, based on the per cent of perfection of the house to an arbitrarily set-up minimum standard house. The record of each house is being tabulated on a special form in the field.

Several of the key facts on the inspection cards as turned in to the office for filing are selected for judging the potential unhealthfulness of the dwelling surveyed. The points used are: location, condition and use of toilets; location, condition and use of water and sinks, screens, roof, floors, walls, ceiling and chimney; the number of families provided for by the dwelling, and the number of persons per room. These specific points are selected for a study of Memphis housing conditions because the problem is not so much the density of population on the land in the sense that there are too many people per acre, although there are a few such cases, but that there is a high percentage of people living in back areas, facing alleys and not adequately supplied with the fundamental sanitary appliances or facilities, as well as poorly designed and constructed dwellings which have a tendency to deteriorate quickly and permanently.

The points outlined when assigned more or less arbitrary numerical values with deductions for unsatisfactory condition of the various items, give a picture of the degree of bad housing in comparison with an ideal minimum standard house as assumed for Memphis. The resulting figure for a dwelling is called the sanitary rating or factor. By combining dwellings into blocks of dwellings, a picture of the degree of the problem as it varies from block to block, or area to area is obtained.

Another factor that deserves consideration when a group of dwellings is considered is the play space or yard, and the location and view from the dwellings because of this influence on insanitary methods of sewage and garbage disposal and general cleanliness, as well as moral influence on the children as shown by juvenile crime, etc. Again, in Memphis a rough figure on this can be secured by using what is called a rear dwelling factor, that is, the per cent of people living on or facing a street in the block. The larger

the per cent of rear and alley dwellers, the lower the rear dwelling factor for any specific area. To arrive at a housing index then, a weight of 3 is assigned the sanitary factor and a weight of 1 is assigned the rear dwelling factor, and the sum of the two is divided by 4. The quotient is the housing index.

By shading on a map of the city the lowest index blocks and then the blocks next best and so on, it has been possible to put on paper, for study, a picture of slum housing conditions so that the cores of bad areas stand out, and radiating from these cores are the slums in varying degrees of dilapidation and insanitation. The areas being blighted by the slum stand out as barriers between the better residential areas and slum areas. As these specific areas are identified and stand out as rotten cores in our slum area, it may be possible to interest groups of property owners in those areas to pool their resources and develop limited dividend housing projects or their equivalent for clearing the area and rebuilding minimum standard dwellings. It is a hopeless task for any one property owner to try to improve his property if it is in the center of a completely dilapidated and insanitary slum area, unless the surrounding property is also improved. (Map I shows the results of this analysis to date.)

Picture 1 illustrates roughly the type of housing that rates less than 30 per cent by this method. These tenants pay $1.75 per week rent for the entire living unit. Picture 2 illustrates an 80 to 100 per cent dwelling renting for $3 a week. This house has inside private toilet and water faucet and sink connected to city sewer and water lines.

The study which is being made of our daily records will assist in presenting a clearer picture of the problem, so that

PICTURE 2—Type of dwelling renting for $3 a week

TABLE I

Slum Data on Rentals, Vacancies and Crowding, Showing Relationship Grouped According to Degree of Bad Housing

	Housing Index See Map I for Legend	*Total Units Occupied*	*Total Population*	*Per Cent Vacant*	*Average Weekly Rent per Unit*	*Average Rooms per Unit*	*Average Weekly Rent per Room*	*Average Persons per Room*
Blocks averaging per cents of a minimum standard	0 to 29.9	1,217	4,002	6.95	$1.78	2.87	$0.618	1.15
	30 to 49.9	5,136	17,554	6.97	2.29	3.16	0.726	1.08
	50 to 64.9	4,022	14,971	5.19	2.75	3.74	0.736	0.99
	65 to 79.9	2,627	10,269	4.58	3.35	4.03	0.831	0.97
	80 to 100	2,092	8,324	3.73	5.71	4.88	1.167	0.81
	Total	15,094	55,120	5.65	$3.03	3.68	0.823	0.99

a practical general housing program from an administrative standpoint can be developed and any progress made can be shown.

It is interesting to note that this same study, made in 1936, shows a direct relationship between the degree of slumness and such items, as, high vacancies, low rents, few rooms per dwelling, more persons per room, etc., as shown by Table I.

The law of supply and demand is plainly indicated. As the rents decrease the housing gets worse, the vacancies increase, crowding increases and rooms per unit decrease. It would seem to point the way to where to apply enforcement proceedings in order to get the greatest returns for effort expended. Private capital getting reasonable rents and not furnishing a minimum standard house should be forced and should welcome this enforcement on all owners without exception, to meet the standard in order to bring all houses in the blighted areas up to a decent standard. However, any effort to enforce minimum standards in the very low rental slum areas where the existing conditions are very bad can result only in slum clearance. This effort is worth while only where there is a sufficient per cent of vacancies, and should be directed toward the elimination of the worst dwellings.

The field of housing and its influence on the public health and welfare of the low wage earner is a most interesting and fascinating problem and promises to attract more and more of the time and study of public health workers. The problem is there whether it is recognized or not. Other groups are promoting a very definite interest and demand for improvements.

SUMMARY

1. Until recent years the housing activities of the Department of Health were carried on largely at the direction of the complaining public and not according to a plan or program designed to meet a public health problem.

2. A housing study was made in 1934 and certain data developed which helped to define the problem in Memphis.

3. A suggested fundamental program for control has been outlined.

4. A housing code is being drawn for early adoption.

5. An analysis of the slum areas is being made. An arbitrary numerical value is assigned to each dwelling.

6. By shading a map of the city on the lowest index blocks and then the blocks next best and so on, it has been possible to put on paper, for study, a picture of slum housing conditions so that the cores of bad areas stand out, and radiating from these cores are the slums in varying degrees of dilapidation and insanitation.

7. Improvements in existing housing furnished by private investment can be obtained only in blighted areas where reasonable rents are collected to justify improvements.

8. Enforcement in the poorest slum areas will result in slum clearance and can be carried only as far as vacancies will permit.

9. Subsidized government housing seems to be the only solution for the non-paying and fractional paying groups of the population.

REFERENCES

1. Sydenstricker, Edgar. The Changing Concept of Public Health. *Milbank Quart.*, XIII, 4 (Oct.), 1935.
2. MacNutt, J. Scott. *Manual for Health Officers.*
3. Graves, L. M., and Fletcher, Alfred H. Housing Problem in a Southern City. *A.J.P.H.*, 25, 1 (Jan.), 1935.
4. Veiller, Lawrence. *Model Housing Code.* 1920.

Control of Food Handlers

COMPLETE knowledge of the amount of illness caused by people who deal with food—"food-handlers" in the American sense—must obviously be lacking. Epidemics of scarlet fever, typhoid and paratyphoid fevers, and epidemic sore throat in recent years in England must have convinced people of the dangers of this source of infection, and a perusal of the rich store of facts compiled by J. C. G. Ledingham and J. A. Arkwright [1] vividly brings home the fact that the carrier is a danger to any food-handling trade. The Americans take these matters more seriously and logically, and the supervision of food-handlers is enforced by comprehensive regulations in the U. S. A. A recent report gives rise to the speculation that some greater measure of control in England might be advisable, although typhoid, for example, is not the common danger here that it is abroad—the result of the pioneer and progressive work on sewage and water supply which England gave to the world. Dr. J. R. Scott [2] of Albuquerque, New Mexico, records the results of 10 years' examination of specimens—presumably feces—from food-handlers. Among 6,600 specimens examined, 20 from 20 individual food-handlers gave cultures of typhoid bacilli, the positive carriers derived from various occupations being 3 per 1,000 among milk producers and among restaurant staffs, and 4 among 700 bakers. It may be that our English system of general supervision and intense "detective work" by efficient bacteriologists when an outbreak occurs is in the long run more effective and less costly than the American system; but is it? Such a system might be described as "delayed preventive medicine," and delay may entail loss of life. —Editorial, *Brit. M. J.* Apr. 24, 1937, pp. 871–872.

REFERENCES

1. *The Carrier Problem in Infectious Diseases*, 1912, Arnold.
2. *Canad. Pub. Health J.*, 28, 1:42, 1937.

Shrimp Inspection*

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THE shrimp canning industry is located exclusively along the South Atlantic and Gulf Coasts, extending from North Carolina to Texas. Since the industry was established about 1880, the annual production has gradually increased until it is now more than 1,000,000 cases. Nearly 50 plants have been in active operation during the past year. The size of the plants varies greatly, some producing only a few hundred cases and others about 100,000 cases a year.

Shrimp is so perishable that decomposition sets in very soon after it is taken from the water unless proper precautions are observed to ice down the catch immediately. Since practically all of the shrimp supply is taken from waters where warm weather prevails, it is absolutely necessary to keep the raw material cool until it is canned. Unless careful preventive measures are observed spoilage may occur on the boats, in transit to the cannery, or during the course of preparation for canning. The greatest problem is the procurement of sound raw material that has been promptly iced. Also of paramount importance is prompt handling after receipt by the cannery. Some spoilage due to underprocessing or other faulty technic in canning has also been encountered.

The detection of decomposed shrimp in the raw state is comparatively simple, since it undergoes changes in appearance and odor that are fairly obvious. After the product has been canned, the appearance and odor are so changed that it is difficult to detect decomposition unless it is extreme. Inspectors of the Food and Drug Administration were aware of considerable spoilage in raw shrimp to be used for canning, but unless the spoilage had progressed to a very pronounced degree, it was impossible to detect decomposition in the canned article. Experiments were, therefore, performed to devise methods of detection.

Several packs of shrimp were prepared from raw material in all stages of decomposition and were examined from the standpoint of those chemical factors which had proved useful in the detection of decomposition in other products. No chemical determination was found to have diagnostic value. Certain odors, however, were detected in the packs which, while different from those of raw decomposed shrimp, were characteristic and definitely identifiable.

The Food and Drug Administration entered upon a program of regulatory activity, based on these methods of examination, which resulted in the seizure of enormous quantities of shrimp and the prosecution of offending shippers under the Food and Drugs Act. In 1934 approximately 25,000 cases of shrimp out of a 900,000 case produc-

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tion were seized. The seized goods had a value of nearly $100,000 and represented almost 3 per cent of the total output.

The record of seizures in 1934 speaks eloquently of the condition of the raw material before the passage of the seafood amendment. Reports of our inspectors reflected the generally insanitary condition of many of the canneries at that time. Sufficient ice was not available on the boats and large amounts of decomposed shrimp were delivered to the canneries. The holds of many boats where the shrimp was stored were not clean. No facilities, or at best inadequate facilities, were available at the canneries for washing shrimp as received. Inspection or sorting belts were not in general use and there was little careful scrutiny of raw material. Frequent delays in canning after receipt occurred, with consequent decomposition. There was little attempt at fly screening or other safeguards against insects. Floors were infrequently cleaned. Wooden table tops and other equipment that could not be maintained in a sanitary condition were generally used. Toilet facilities were inadequate and often there were no provisions for washing the hands of the operators. The buckets used by the pickers were not clean, and were returned containing the excess of meats over the weights for which the pickers were paid. These excess meats always accumulated in the bottom of the buckets and were returned time and again during the day with consequent spoilage. Water supplies were frequently polluted.

Processing was sometimes inadequate, and recording devices to check the operation were not generally used. There is little wonder that objective examination of shipments of canned shrimp frequently revealed decomposition. It should also be borne in mind that the examination did not permit detection of the filthy conditions frequently prevailing in the canneries.

Since the beginning of our regulatory operations there has developed a demand in the shrimp industry for a system of self-imposed inspection, financed by the industry if necessary, which would insure a product of unimpeachable quality. This would relieve the industry of the burden that heavy seizures had imposed. As a result of these demands, Congress in June, 1934, passed the "Seafood Amendment to the Federal Food and Drugs Act."

In its broader aspects the seafood amendment simply authorizes the Secretary of Agriculture to assign full-time inspectors to those plants that desire the service, and are willing to pay for it, to see that only shrimp that is entirely fit and legal in every respect is packed. Shrimp packed under inspection must be labeled "Production Supervised by U. S. Food and Drug Administration." The type of inspection provided is unique. It parallels to a degree the Meat Inspection Act in that it contemplates continuous inspection during the manufacturing process, but differs from that Act since the cost of inspection is assessed in part against the industry, and acceptance of inspection is entirely voluntary on the part of any manufacturer. So far as I know, there is no precedent for this type of food inspection.

Under the Food and Drugs Act, prior to the passage of the seafood amendment, federal regulation was limited to penalties in the form of seizures and prosecutions. With the difficulties involved in the procurement of suitable raw material and the keen competition among the canners, the industry as a whole was unable to respond to the pressure exerted through seizures to produce an unobjectionable product. An industry less highly competitive and

with a more practical control over the source of raw material might yield to the punitive measures provided by the normal enforcement of the Food and Drugs Act, but the conditions in the shrimp industry were such that drastic measures beyond those provided by the Food and Drugs Act had to be taken if the consumer was to be properly protected. Probably the plan of self-imposed government inspection is the most economical and efficient system to cope with conditions as they existed.

Let us now picture the plants operating under inspection contrasting the conditions with those before the inspection system was instituted. Before inspection is granted certain minimum conditions of equipment and facilities, based on the best possible sanitary practices, are required. Thorough screening must be provided to assure freedom from flies and other insects. Adequate washing devices to clean the raw material are required. Suitable inspection belts must be available. Picking and packing table tops, wash tanks, flumes, blanching tanks, brine tanks, and all utensils for handling the shrimp must be of metal other than lead, or of some other smooth, hard, non-porous material that can be readily cleaned. Adequate supplies of steam and clean unpolluted water must be provided. Adequate toilet facilities and wash basins with soap and paper towels are required. The plants must be equipped for code marking cans and with adequate instruments to record time and temperature.

After inspection is granted, the plant is not allowed to operate in the absence of the inspector, and the entire manufacturing process is constantly under his immediate supervision. Unfit shrimp is immediately condemned and slack sanitary practices are corrected at once. The shrimp is not admitted to the plant unless properly iced and free from spoilage. The decks and holds of boats and other conveyances are kept in a sanitary condition, thoroughly washed and disinfected with live steam or chlorine after each delivery. Raw material is handled expeditiously and under conditions to guard against spoilage or contamination. All equipment is kept clean and washed with unpolluted water and thoroughly steamed whenever necessary. Waste does not accumulate. All employees handling shrimp wash their hands after each absence from their post and observe all other habits of cleanliness.

The processing of the canned article is checked by personal observation and automatic temperature recording devices. As a final check-up the inspector is required to examine the canned product to determine its fitness.

In addition to demanding the production of unspoiled shrimp, the inspector keeps a constant check on weights, grade marks, and other types of misbranding. All labels used on inspected shrimp must be approved.

From time to time check-ups are made throughout the country to prevent the marketing of uninspected shrimp under any condition that would lead the consumer to believe it to be inspected shrimp.

The procurement and training of suitable personnel to operate the inspection system presents no small difficulty, but we have been successful in maintaining a force of able men of unquestioned integrity. The inspectors are all employed from civil service registers requiring at least a bachelor's degree with specialization in some science, usually chemistry. Before an inspector is appointed he is interviewed by a responsible officer of the Food and Drug Administration, and an estimate is made of his fitness. After appointment he serves a probationary period of 1 year. The initial salary is at the rate of

$2,000 a year, subject to furlough during the time that the shrimp plants are not in operation. The inspectors average about 8 months' employment per year. When the inspector reports for duty he is given intensive training for a period of approximately 2 weeks and assigned to a plant where he works under the supervision of an experienced man.

Approximately 95 per cent of the shrimp production will be under government inspection this year. A word of commendation is not out of order for an industry that accepts a plan such as is provided by the seafood inspection amendment, involving as it does the cost of installing the equipment demanded as a condition to granting inspection, which is entirely voluntary and the cost of which, until this year, was underwritten entirely by the industry. The system costs approximately $85,000 a year to operate and this year about half is being paid by the industry and half by the government.

When we picture the insanitary conditions in the canneries prior to the passage of the seafood amendment and compare them item by item with the conditions existing today, we must conclude that this operation has justified itself by the results obtained.

Rural Hygiene

"The European Conference in 1931 proposed that a new Conference on rural hygiene should be convened in 5 years' time to examine the results achieved and to adopt its recommendations to current problems and to the progress of public health technique.

"The Bureau of the Health Committee, in taking up the question of the preparation for this further Conference, expressed its opinion to the Council that, whereas at the 1931 Conference the various problems connected with rural life were approached more especially from the medical and health standpoints, subsequent enquiries had brought out more and more clearly the need for extending the scope to include more general considerations —that is, certain social and economic aspects of rural life.

"The health, social and economic aspects are, in fact, interdependent, and, if truly practical and not merely theoretical results are to be achieved, rural hygiene questions must be placed in their general setting—namely, that of rural life—while account must be taken of the factors of all kinds which come into play.

"It is indeed increasingly evident that to be successful in his efforts the hygienist cannot remain isolated in his field but must seek the collaboration, and endeavour intimately to coördinate his own work with that of all the various agencies concerned with the different aspects of a rural community's activities, the life of which represents one coherent whole."—Twenty-fifth Session of the Health Committee, League of Nations, May 4, 1937.

Practical Procedures in the Laboratory Diagnosis of Typhoid and Clinically Related Fevers*

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THIS paper is limited largely to the discussion of such procedures as have been found by the writer and his coworkers to be practical and best adapted to the laboratory diagnosis of typhoid and clinically related fevers.

While the incidence of typhoid fever as indicated by the mortality rate has steadily declined during the past decade, especially during the last 5 years, this disease is still a problem of major public health importance in Georgia, a state with a population of 3,000,000, 37 per cent of whom are Negroes. On a basis of 8.6 deaths per 100,000, assuming the usual case mortality of 10 per cent, 2,500 cases may have occurred in Georgia in 1935, although only 1,013 were reported. It is apparent, therefore, that there is abundant material for laboratory study.

The problem of accurate clinical diagnosis of typhoid fever in Georgia is complicated by the relatively high incidence of malaria and endemic typhus, both of which simulate typhoid, especially at onset; and often differentiation is dependent on laboratory aids. The extent to which the physicians are availing themselves of such assistance is evidenced by the fact that during the past 10 years (1926–1936) the writer and his coworkers have handled 30,902 specimens of blood, subjecting these to serological tests for typhoid, typhus, undulant fever, and tularemia, and to cultural study of the clot. At least 90 per cent of these specimens were collected by physicians and health officers throughout the state in Keidel tubes and shipped to the laboratories by mail. Tables I and II summarize the results obtained. While this service was partly in operation prior to the period covered by Tables I and II, it was not until 1929 that the present system was instituted. Beginning with 431 specimens in 1926, the number has steadily increased to 5,769 in 1935. Experience gained through trial and error and the steadily increasing load has brought about many changes in the details of technic. The present procedure is described, not for the purpose of advocating its adoption by other laboratories, but as a guide for the discussion of certain features.

The outfit furnished for submitting whole blood for all purposes is the Keidel tube. This is more expensive than a plain test tube or vial, but this expense is willingly borne by

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

TABLE I

Clot Cultures of 28,066 Specimens Blood

		Positive Clot Cultures						
			B. paratyphosus					
Year	Total Specimens	B. typhosus	A	B	C	Total	Br. suis
1926	431	92	..	..	..	..	..
1927	828	134	..	..	..	..	..
1928	1,241	134	3	1	..	4	7
1929	1,942	175	3	..	..	3	6
1930	2,569	322	..	5	..	5	4
1931	3,345	410	4	2	..	6	9
1932	3,687	390	1	7	1	9	4
1933	4,118	284	..	..	..	0	6
1934	4,846	399	..	5	3	8	12
1935	5,059	346	..	2	3	5	6
Total *	28,066	2,686	..	..	..	40	54

* In addition 2,836 specimens were examined by serological tests only.

the physicians who have long ago come to consider the convenience of a sterile complete outfit ready for use at the home bedside well worth the price. Since most of the outfits are used for syphilis serology, the information blank is arranged primarily for this purpose. Space is provided so that the clinician may request serological tests for fevers and blood culture. All specimens accompanied by such special requests are referred to a separate department of the laboratory and subjected to the procedures herein described.

THE CLOT CULTURE

The tube is opened and enough serum is removed aseptically to provide for all serological purposes, including Wassermann and Kahn test, if requested. The balance, consisting chiefly of the clot, is transferred to such liquid medium as is best suited for the desired purpose. If enteric fever is suspected, Conradi's bile medium is used; if septicemia, the clot is first comminuted by forcing it through the nozzle of a sterile 10 c.c. syringe into glucose broth or Kracke's [1]

TABLE II

Agglutination Tests on 30,896 Specimens

		Positive Agglutinations			
Year	Total Specimens	Typhoid	Typhus	Undulant	Tularemia
1926	431	252	5	....	....
1927	828	407	57	....	....
1928	1,241	468	35	20	....
1929	2,003	816	97	29	59
1930	2,950	1,133	244	40	58
1931	3,530	1,084	189	58	34
1932	3,836	918	305	56	31
1933	4,785	437	514	49	32
1934	5,523	448	399	74	80
1935	5,769	408	524	59	46
Total	30,896	6,371	2,369	385	340

brain liver infusion broth. The technic of comminuting clots was devised by the author and has been described in a previous publication.[2] Recently desoxycholate broth has been added as an alternative, or for use in parallel with Conradi's bile. The liquid media are all put up in wide mouth 2 ounce Packer bottles closed with U-Press-It caps.

After inoculation, the culture bottles are stacked in metal racks each holding 8 bottles, and provided with holes for the insertion of sub-culture slants.

After overnight incubation, sub-cultures are made on infusion agar slants and the cultures and sub-cultures are returned to the incubator. Replants are made from the bile cultures on the same agar slants each day for 4 days, unless growth occurs in the meantime. The broth or Kracke cultures are transplanted only every 2 or 3 days, and in the absence of growth on the slants are kept under observation for 10 days or 2 weeks.

If *B. typhosus* is present in the clot, growth will appear as a rule on the transplant after the first 18 to 24 hours' incubation. Table III shows the incidence of delayed growth in a series of 2,126 positive cultures.

When the growth on the agar slant is obviously a contamination, further transplants are made on Endo, bismuth sulphite, and Leifson's[3] desoxycholate citrate, which tend to inhibit further growth of contaminants and allow the enteric group to grow. It is not necessary to detail the method of specific identification of organisms thus isolated. Those suspected of being pathogenic are subjected to as many critical tests as are necessary to establish identity. The plan of identification is quite similar to that described by Coleman.[4]

TABLE III

Showing Incidence of Delayed Growth of B. typhosus in Conradi's Bile Medium

Growth on Transplant (Hours)	*Number Cultures Positive*	*Per cent*
24	1,683	78.9
48	315	14.9
72	97	4.7
96	31	1.5
Total	2,126	100.0

Harris of our laboratory has recently experimented with plain sodium desoxycholate broth as a substitute for Conradi's bile salt, and found it to be not only quite as satisfactory in growing *B. typhosus,* but more inhibitive of the development of Gram-positive contaminants. In a series of 1,000 specimens cultured in both media in parallel, the incidence of contaminations was reduced to 35 per cent by the desoxycholate broth.

As is shown in Table I, *B. typhosus* was isolated 2,686 times from clot cultures. Table IV shows the relationship of 2,064 positive clot cultures to the macroscopic Widal test.

It is shown that the sera of 40 per cent of over 2,000 positive clots gave negative or doubtful Widal reactions, as

TABLE IV

Relation of 2,064 Clot Cultures Positive for B. typhosus to the Macroscopic Widal

Total Positive Cultures	*Widal (Mean Readings)*				
	Negative	*Doubtful*	*Weakly Positive*	*Positive*	*Strongly Positive*
2,064	600 or 29%	241 or 11.6%	323 or 15.6%	339 or 16.6%	561 or 27.2%

TABLE V

Variability of the Widal Test as Compared with the Blood Culture in a Study of 14 Cases of Typhoid in a Milk-borne Outbreak

Date 1933	*Case*	*Number Days Ill*	*Macroscopic Widal*	*Blood Culture*
11/ 4	N. G. 1	8	+	Positive
	N. G. 2	10	+++	Positive
	C. J.	1	—	Positive
11/ 7	Mrs. H.	4	++	Positive
11/ 8	J. L.	4	—	Positive
11/ 8	C. H. 1	7	—	Positive
	C. H. 2	9	—	Positive
11/10	E. P.	5	+	Positive
	V. C.	4	—	Positive
11/14	R. C. E.	10	+	Positive
	R. C. E.	16	+++	Positive
11/13	D. S.	7	—	Positive
11/16	Mrs. E.	4	++	Positive
11/14	W. J. H.	4	—	Positive
11/16	R. E.	3	—	Positive
11/20	S. P.	13	+++	Positive

compared with 60 per cent which gave significantly positive Widals. Since no data are available regarding the duration of fever at the time these specimens were collected, it is difficult to interpret these results. They do indicate, however, the unreliability of the Widal test.

Table V illustrates the efficiency and practical application of the blood clot culture. This pertains to an explosive milk-borne outbreak of 15 cases of typhoid fever occurring in a small town 150 miles south of Atlanta in 1933. Blood specimens from 14 were mailed to the laboratory in Keidel tubes by local physicians. All yielded positive clot cultures. It is interesting to note the inconstancy of the Widal in this series. The 15th case was a child too small to be bled, but a stool culture was positive. Two other cases of fever occurring in the vicinity at the same time were presumptively diagnosed as typhoid, though serological studies later revealed that these were endemic typhus.

Organisms of the paratyphoid group were isolated only 40 times, as compared with 2,686 isolations of *B. typhosus*. Since the paratyphoids grow just as readily in the media employed as does the typhoid bacillus, it is the writer's opinion that this is a fairly accurate index of the low incidence of paratyphoid infection in Georgia.

Brucella suis was isolated from Conradi's bile 54 times (see Table I). *Brucella abortus* was obtained only once and this was from a broth culture.

SEROLOGICAL

After the serum of the specimen has been cleared by centrifuging, it is set up by the usual macroscopic tube technic against the antigens of typhoid, typhus, Brucella and *B. tularense*. The final dilutions range from 1:40 to 1:360, or higher as occasion demands. Incubation is at 37° C. for 4 hours, then overnight in the ice box.

The antigens are:

1. Typhoid "O" prepared by the alcohol method of Bien,[5] using a smooth strain known as "Mitchell."

2. Weil-Felix—Suspension of a fresh living culture of Proteus X19 derived from smooth or "O" colonies.

3. Brucella—Suspension prepared from *Br.*

sis—killed by heat 62–65° C. for 30 minutes and preserved with 0.2 per cent formalin.

4. Tularemia—Suspension prepared according to method of Francis.[6]

RECORDING OF REACTIONS

Reactions in each tube are recorded as from zero to 4 plus, according to the degree of sedimentation and flocculation. These readings are translated in expressions of negative, doubtful, weakly positive, positive, and strongly positive, rather than in terms of the actual titers for each dilution. It was felt that since the laboratory worker is more familiar with the normal limitations and specific behavior of each antigen, this plan would be less confusing to the physician. For example, one should be more conservative in interpreting a 4 plus reaction at dilution 1:160 for typus than the same reading for undulant fever or tularemia, since the former is much less specific.

When considerable degree of agglutination occurs with 2 or more antigens, the one showing the highest titer is as a rule (not always) the most significant. When such multiple reactions occur, the report is accompanied by a letter cautioning the physician to apply his clinical differentiation more closely and requesting a second specimen. In this letter the normal limitations of each antigen, anamnestic phenomena, delay in specific agglutinin production, etc., are discussed. It has been the writer's experience that stereotyped form letters or printed interpretations are inadequate. In other words, it is often necessary to individualize the case. The average physician will read and appreciate a personal letter all the more if he is dealing with a case difficult of diagnosis. Incidentally many such obscure cases are encountered by southern practitioners who are constantly beset with the problem of early differential diagnosis of such infections as malaria, typhoid, typhus, undulant fever, and tuberculosis, all 5 of which may so simulate each other clinically as to defy early differentiation.

Unfortunately, serology is of very little value in early diagnosis. For the first week after onset of fever, be it typhoid, typhus, or undulant, the physician must rely solely on clinical findings. If he is dealing with typhoid fever, well enough for he has recourse to blood culture; if typhus, he may wait until well into the second week for a positive Weil-Felix test. Since brucellosis rarely begins with an acute onset, the physician as a rule does not see the patient until many days after onset and until specific agglutinins have formed in abundance. In this respect, tularemia often presents puzzling problems, since not all cases present the classical findings and history of exposure.

Nevertheless, in spite of many complicating and limiting factors, serology is an invaluable aid in the differential diagnosis of fevers.

THE WIDAL TEST FOR TYPHOID

While the Widal test, either micro- or macroscopic, continues to enjoy popularity in the laboratory diagnosis of typhoid fever, it is beset with serious limitations, such as:

1. It is of little or no value for early diagnosis. Fortunately the blood culture has now been developed to supply this need.

2. Interference by vaccine agglutinins. A large portion of our population has at some time received typhoid vaccine. While the agglutinins produced thereby may have subsided below the measuring point, they are very apt to flare up at any time under the exciting influence of other fever producing infections (the so-called anamestic phenomenon). Recent development of our knowledge of flagellar and somatic, or H and O, or smooth and rough agglutinins, have made it apparently possible to distinguish between vaccine and infection agglutinins. So far, however, this distinction is too controversial

and unreliable to warrant practical application. The writer and his coworkers have for several years been using an alcohol killed or "O" antigen exclusively, but have encountered many inconsistencies which confuse both the laboratorian and the physician. Until such time as immunologists have come to agreement and have given us a more specific practical technic, we shall regard the Widal test for typhoid fever as of questionable value.

THE WEIL-FELIX TEST FOR TYPHUS

Endemic typhus has assumed proportions of an important public health problem in Georgia. During the past 5 years 1,963 cases have been reported. Of 485 cases reported in 1935, our laboratory aided in the diagnosis of 240. In the Weil-Felix test the antigen is prepared with *B. proteus* X19, an organism which apparently has no relation to the causative agency of typhus. It is not surprising, therefore, that proteus agglutinins produced by conditions other than typhus are encountered. Such is the case. A recent investigation was made of the clinical histories of 116 specimens which gave weakly positive and positive Weil-Felix reactions. Of 66 showing complete titers at 1:160 dilution, 33 per cent proved ultimately to be specific for typhus. Of 50 showing complete titers at 1:320 but not higher, 72 per cent proved specific. This indicates that in the absence of typical clinical findings the physician should be on his guard in interpreting the diagnostic significance of Weil-Felix titers under a dilution of 1:320 of patient's serum. When in doubt he should submit a second specimen. If his patient has typhus, the titers will climb rapidly; if not, the titers tend to remain stationary.

Care should be taken to keep the antigen "smooth" and to use only living suspensions.

BRUCELLA

The agglutination test for undulant fever is highly specific. While any one of the 3 species of Brucella may be employed as antigen, *Brucella abortus* is more commonly used. So far we have used only the tube method, but a recent trial of Huddleson's rapid slide technic proved quite satisfactory. All reactions complete at 1:320 or higher are reported as positive and a follow-up of the clinical history is made. Very rarely does a reaction reported as positive prove to be nonspecific. In a few instances the patient had no symptoms, but gave a history of a previous attack, or had been closely associated with infected animals.

TULAREMIA

The most specific of all agglutination reactions is that for tularemia. For many years we have used suspensions of *B. tularense* No. 38 obtained from the National Institute of Health. This is supposedly a non-pathogenic strain, hence the risk of infection among laboratory workers is minimized. Cross-agglutinations with *Brucella abortus* are occasionally encountered, but rarely cause serious difficulty.

Of 43 cases of tularemia reported in Georgia in 1935, 39 were confirmed by agglutination reactions.

The routine testing of all specimens of liquid blood submitted for purposes other than syphilis serology results in the detection of many cases of typhus, undulant fever, and tularemia. It is the writer's opinion that this service has done more to popularize the laboratory and to acquaint the general medical profession with these relatively new diseases than any other agency.

THE FECES CULTURE

The use of the feces culture as an aid in the early diagnosis of typhoid fever has always been limited for the following reasons:

1. While typhoid organisms are probably

present in the intestinal contents at onset of fever or even before, they are relatively few in number as compared with the myriads of colon bacilli and related normal inhabitants. Not until about the end of the second week of fever are they released through the biliary system and necrotic Peyer's patches in sufficient numbers to be found readily by the usual cultural methods.

2. No differential plating medium has yet been devised which consistently suppresses the growth of the colon group so as to allow the typhoid colonies to develop without interference.

A most fascinating array of differential media has been developed. Most of these are based on biochemical reactions of metabolic by-products of various types of organisms with certain indicators producing colonial color contrasts. Among those most widely used are Endo's agar, Levine's methylene blue agar, Krumwiede's brilliant green agar, and MacConkey's neutral-red-bile-salt-lactose agar. While these and many others less widely used are useful, especially for isolating the paratyphoids and the dysentery group, they all fail sufficiently to suppress the growth of the normal intestinal flora to permit the detection of *B. typhosus* when present in small numbers. He who devises a medium which meets these demands, which is simple of preparation, and produces consistent results in the hands of the majority of workers, will indeed make a great contribution, not only in improving the efficiency of carrier detection, but also in rendering feasible feces culture as a means of early diagnosis of enteric infections.

In the writer's experience, the bismuth sulphite agar devised by Wilson and Blair [7] goes far toward meeting the desired requirements. This medium has been in use in our laboratories for 4 years. We had for many years relied upon Endo's and to some extent Levine's eosin-methylene-blue agar for the plate culturing of feces previously. Over these the medium of Wilson and Blair possesses the following advantages:

1. *B. coli* and its relatives, while not always completely suppressed, grow so scantily that *B. typhosus* colonies have ample room to develop.

2. The typhoid colony with its large smoky halo is easily detected even in the presence of heavy growth of other organisms. The fewer the typhoid colonies, the larger their reactive zones and the more characteristic they appear.

3. Bismuth sulphite plates may be heavily inoculated with feces with very little danger of overgrowth, except from the typhoid bacillus itself. This is of considerable advantage in mass culturing of large groups of food handlers. We have found that even one plate per specimen of bismuth sulphite agar will yield a higher percentage of positive findings than several plates of Endo. This saves much time and material.

On the other hand, certain disadvantages must be admitted—

1. Bismuth sulphite agar does not produce distinctive colonies for the paratyphoids. *S. Schottmuelleri* at times produces colonies with dark halos, but not consistently so. Furthermore the various members of the *B. dysenteriae* group do not grow at all.

2. Characteristic colonies of *B. typhosus* require 36 to 48 hours to develop.

3. Bismuth sulphite agar is more difficult to prepare, at least according to the experience of others. We rarely experience this, and after adopting the latest modifications [7] we find it no more difficult than Endo to prepare and preserve.

4. Poured plates apparently deteriorate after 2 or 3 days. However, the media ready for use may be stored in bottles with airtight stoppers and kept in the ice box for many months without losing sensitivity.

The objection was raised by one correspondent that not all strains of *B. typhosus* will grow on bismuth sulphite agar. This may be true of certain old laboratory strains, but not for those freshly isolated. For example, 113 strains isolated from blood grew typically on bismuth sulphite agar plates without exception. Typical colonies were also produced by such old laboratory strains as Hopkins,

Rawlings, Roseman, O-901, H-901, Watson and Ty 2 (the last 4 supplied by Felix). Two old strains supplied by Stovall of Wisconsin were the only ones which did not grow.

We have recently become interested in Leifson's desoxycholate citrate agar. It inhibits most strains of the colon bacillus considerably. Those which do grow produce red colonies in contrast to the translucent colorless colonies of *B. typhosus* and the paratyphoids. Colonial development is more rapid than on bismuth sulphite plates, requiring only 24 hours for optimum differentiation. That it does not inhibit the paratyphoids and the Flexner types of the dysentery bacillus is another point in its favor. Frequently, however, the plates show a heavy growth of more or less colorless colonies which on critical inspection are obviously not typhoid or paratyphoid, but which interfere with the detection of the latter when present in small numbers. Herein bismuth sulphite has a distinct advantage, in that the fewer the typhoid bacilli in a given specimen, the larger and more conspicuous the colonies on bismuth sulphite.

We are now experimenting with Leifson's Selenite F enrichment medium as a substitute for or alternative of Teague's glycerine saline, but are not prepared to report results.

SUMMARY

1. The task of examining over 30,000 specimens of clotted blood for typhoid and certain clinically similar fevers has led to the development of a technic which the writer believes to be practical and reasonably efficient. This technic is described.

2. Among 2,686 positive clot cultures, the paratyphoids A, B, and C were found only 40 times. This is a true index of the relative rarity of actual paratyphoid fever in Georgia.

3. The Widal test is not a reliable procedure in the laboratory diagnosis of typhoid fever.

4. The limitations of the Weil-Felix test for typhus are discussed.

5. Feces cultures should play an important part in the early diagnosis of typhoid. The need for more efficient differential media for this purpose is emphasized.

6. Bismuth sulphite agar is in the writer's experience superior to any other plating medium so far devised for the isolation of *B. typhosus* from feces.

REFERENCES

1. Kracke, R., and Teasley. *J. Lab. & Clin. Med.*, 16:183, 1930.
2. Sellers, T. F. Lab. Notes. *A.J.P.H.*, 20:195, 1930.
3. Leifson, E. *J. Path. & Bact.*, 40:581, 1935.
4. Coleman, M. *Year Book A.P.H.A.*, 1935, p. 149.
5. Bien. *Centrlbl. f. Bakt.*, Orig. 193, 196, 1924.
6. Francis, E. *Pub. Health Rep.*, 41:1273–1295, 1926; *Reprint 1089*.
7. Wilson, W. J., and Blair, E. M. *J. Hyg.* (Brit.), 31:138, 1931.

The Compensation Aspect of Industrial Hygiene*

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THE subject of occupational diseases is of more than passing importance to the National Bureau of Casualty and Surety Underwriters, representing as it does a group of some 40 casualty insurance companies, which write yearly about 100 millions of dollars worth of compensation business in the United States.

One of the major jobs with which our Bureau is charged is that of doing what it can, and all that it can, to assist in the prevention of injury to workers in industry, whether that injury results from accidents or from disease. We therefore have a common interest with the manufacturer in the prevention of disease—especially those diseases commonly considered occupational whether compensable or not.

Almost since the beginning of compensation, the compensation laws have gradually been liberalized by statute or by interpretation. Such liberalization naturally increased the number of accident claims and the number of occupational disease claims, and particularly the number of claims allowed. In the last few years, moreover, occupational disease claims have grown at an alarming rate. They represent today one of the important problems of industry.

It must be remembered that any increase in the cost of compensation, due, for instance, to compensating for occupational diseases, ultimately passes on to industry. It is no exaggeration to say that the financial life of some of our most important industries is at stake, and serious effects will occur if measures are not taken to remedy the conditions causing occupational disease.

It must also be remembered that, in the final analysis, the people in each state are the ones who decide, through legislation and through their courts, what compensation is to cost the industries in that state and to what extent the people themselves are willing to pay increased compensation costs through higher prices for all the commodities they buy. Within the scope and the provisions of any given compensation law, the costs to the industries, and then to the people of that state, can be kept to a practical minimum only by and with the coöperation of the state authorities—and in that important group I include, as of very great importance, the state health authorities.

When one considers that the effects of many occupational diseases may be permanent, that some of them are not subject to cure in the ordinary sense of the word, it is apparent that the answer to the occupational disease problem lies not in compensation, but

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in the strictest measures for the prevention of the diseases themselves.

I need not go into the conditions and factors causing occupational disease—you are more familiar with these than am I—but we are all agreed, I am sure, that occupational diseases are caused by the unhealthful industrial environmental conditions incident to the occupation of certain of those engaged in industry, and, further, that these unhealthful environmental conditions may not only cause occupational diseases, but also increased incidence of disease among the general population. Furthermore, I am sure that we all agree that they should be controlled.

In order to indicate the importance of the occupational disease situation, I present the following figures, which by no means include all the striking cases which could be cited, but at least give us some idea of the extent of the problem.

Perhaps the most complete figures available to us are those showing the experience in South Africa. According to the 1932 report of Miner's Phthisis Prevention Board, an aggregate of $65,000,000 has been paid for compensation of silicosis alone, with an additional $34,000,000 liability outstanding. The amount awarded for silicosis in the year 1932 was $6,000,000. A number of the individual states have larger groups of wage earners in the manufacturing and mining industries than has the Union of South Africa. Furthermore, instead of merely the one problem of silicosis—to be sure of great importance—there is a considerable number of occupational disease problems confronting you in the wide diversity of occupational disease hazards existing in our industries.

In the County of Cumberland, New South Wales, the Workmen's Compensation Commission reports, with relation to workers exposed to silica dust, and over approximately 5 years ending March, 1932, that their expenditures for compensation, medical expenses, committee fees, staff salaries, office and administration charges total approximately 6 per cent of the pay roll of the workers exposed to such dust. The expenditures for compensation and medical expenses alone average about 5.3 per cent of the pay roll. On a normal casualty insurance basis that would be equivalent to a compensation rate of approximately $9 per $100 of pay roll.

In Ontario, the Compensation Board has paid up to January 1, 1934, a total of $880,000 for compensation and medical aid for silicosis.

In both South Africa and Ontario, health organizations are conducting outstanding work along preventive lines. In South Africa the "attack rate" of silicosis has been remarkably reduced through the efforts of health authorities. In Ontario, a Bureau of Industrial Hygiene in the Department of Health is making noteworthy progress in coping with the occupational disease situation.

During the present decade, and in the United States in particular, compensation payments for occupational disease have been increasing tremendously, both as a whole in comparison to the total payments for compensation for accidents and, even more strikingly, in individual classifications of industry where occupational disease hazards are severe.

In Massachusetts, the compensation insurance rate for stone cutting per $100 of pay roll was raised from $2.84 to $4.77 in December, 1927. However, many carriers requested and received approval of a $10 rate for many risks. Later, because of wage reductions, a $12 rate was approved for a period beginning June, 1932, but by

November 1, 1932, no company would write the insurance at that rate.

The present rate is $5 plus an additional occupational disease hazard payment of $300 per year for each employee ($25 per month for any employee on the pay roll during all or any portion of any calendar month).

The $300 per capita rate was based on the fact the experience for stone cutting for the policy years 1926 to 1930 inclusive disclosed a total of 92 pneumoconiosis cases, with an incurred loss of $288,075, the average claim cost being $3,131. It was estimated that many employees then in the industry would within the next 10 year period develop the disease, making it necessary to collect over that period the sum of $3,000 per man.

In Wisconsin, the total amount of actual indemnity paid in all occupational disease cases is reported as being about $52,000 in 1922 and about $251,860 in 1933, the cost having increased virtually fivefold in 11 years.

Another group of interesting figures can be taken from the National Council on Compensation Insurance report for the policy year 1933. Four states—California, Connecticut, Massachusetts, and Wisconsin—show total losses from pneumoconiosis of $385,662, and a total of $175,184 assigned to diseases other than pneumoconiosis—a grand total for all occupational diseases of $560,840.

The foregoing figures serve as tangible evidence of the monetary costs of occupational diseases. It is perhaps unnecessary for me to explain that compensation insurance rates are based on the actual compensation costs in a given industry, and are therefore a reflection of conditions existent in that industry.

The figures I have presented relate primarily to compensation costs. There are other, and perhaps greater, costs with which you, as health authorities, are more familiar than I am. Those are the indirect losses which are the resultants of disease. They include the waste involved when life expectancy is shortened, with the cost to the state when morbidity rates increase due to inadequate preventive measures. The economic waste resulting from occupational disease may be greater in proportion than that accruing from the usual run of diseases, due to the fact that the wage earner is the one primarily disabled. Impairment of the wage earner's health may affect the general welfare and health of his family. I leave it to you to evaluate the costs to the state which are to be superimposed upon those for compensation which I have presented to you. From an economic point of view alone, the occupational disease problem is one of commanding importance.

Money spent by an individual or a community may be classified as either an expense or an investment. It has become generally recognized that money spent in behalf of health represents an investment of the first order.

The National Bureau of Casualty and Surety Underwriters realize that the only solution of the occupational disease problem lies in the correction of the conditions causing those diseases—in their prevention. The manner in which this may best be undertaken has been given careful consideration.

The reports of the Industrial Hygiene Committee of the State and Provincial Health Authorities of North America for the past several years, provide ample evidence that health authorities have given this matter their most serious attention.

It is the health department which is concerned with mortality and morbidity rates, and, if faulty industrial conditions increase those rates, both

for the diseases not specifically occupational, and also for the specific occupational diseases, such as silicosis, asbestosis, benzol poisoning, lead poisoning, etc., the power to prevent disease should rest with that department.

The problem of prevention cannot be solved by industry alone and of itself, because few industries possess complete information from a medical standpoint as to the results to be expected from the use of many of the materials which may enter their products or their processes. Few industries possess laboratory facilities sufficiently adequate, or personnel sufficiently well trained, to enable them to evaluate and control the occupational disease hazards which may exist in their own raw materials, processes, and products.

The public health authorities have repeatedly stated that health is purchasable. The amount of disease prevention work that you are capable of doing is dependent to a considerable measure upon the amount of money provided, and this amount in turn is dependent to a considerable extent upon the service that you are providing to the public and to the various groups which make up the community.

May I bring to your attention the fact that, in undertaking the prevention of occupational disease, you will be in close contact with industry, labor, and insurance interests, as well as with the community as a whole, and that you will be conferring inestimable service upon them which should be reflected in the amount of money provided for your activities.

We believe that within the department of health, there should be a bureau or a division specifically charged with prevention of occupational disease.

CONCLUSION

The desirability of organizing a bureau of this type in the state department of health has been shown by the results obtained in the State of Connecticut where such a bureau has been conducting occupational disease control activities for the past 8 years. I believe that similar units which have been organized during the past year in 17 state health departments will soon be in excellent position to control the occupational disease situation in their respective states.

It is particularly fortunate that most states have vested broad powers in the department of health, charging these departments with the prevention of disease and authorizing them to maintain supervision over the health of the people. In some states enabling legislation may be desirable or necessary to undertake control of occupational disease, but apparently no such legislation was required for organizing or assisting the bureaus of industrial hygiene in health departments of 17 states during the past year, and these represent the great majority of the industrial states of the country.

We are all interested primarily in *prevention* of occupational diseases, and I can assure you, wherever the stock casualty insurance companies can render assistance to the program of the health authorities in occupational disease control, they will gladly extend their services.

Progress in Industrial Sanitation*

With Special Reference to the Control of Industrial Dust

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OCCUPATIONAL diseases are controlled, primarily, by maintaining proper working conditions. This is an engineering problem to a very large extent although a complete program of industrial hygiene requires the closest coöperation between the medical, engineering, and chemical specialists in this field. Together they discover the principal causative factors and their relative importance in the production of a certain industrial disease. Through proper correlation of such data as concentration of toxic substances at the various work places, length of exposure, and sickness and mortality experience among the exposed workers, they may be able to estimate maximum permissible concentrations of toxic gases or dusts which can be tolerated without harm. Employing such figures as criteria, certain conclusions may be reached with respect to the efficiency of control effected by different methods and equipment. Basic engineering data are obtained from which it is possible to develop systematic procedures of design carrying with them reasonable guarantees of efficient operation of the resulting equipment.

Complete coöperation as outlined has been employed only in the investigation of a few industrial diseases. In general, it may be said that physiological and medical knowledge of the causes and manner of action of occupational diseases has outstripped the development of effective methods of engineering control. The latter have been to a large extent empirical. Owing to the absence of basic standards against which to compare results and to the absence of practical measuring instruments as well, control equipment has not been tested—as a steam turbine, for example, is tested after installation to determine its efficiency. The manufacturer of control equipment has been required to guarantee only those results required by governmental regulations. There has been no great amount of money available for research and development of new, more efficient, and less costly methods and equipment.

The recent general recognition of employer responsibility for occupational diseases by the courts and in workmen's compensation acts has added greatly to the importance of control equipment from the standpoint of efficiency, and cost, *per se*, has become less important than heretofore. This has made it essential to replace empirical rules of design with fundamental

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engineering methods. Equipment for the control of hazardous substances must now be purchased under the same basic type of performance guarantee and maintained in the plant with as much care as any other parts of the production equipment. Unless this is done, compensation costs may become prohibitive.

Industrial dust is regarded as an outstanding hazard in many manufacturing establishments. The problems associated with its control are typical of the whole field of industrial sanitation, and a discussion of them will indicate the progress that has been made and the problems that are to be met in the future of this relatively new field of public health engineering. From an engineering standpoint, consideration must be given to 3 aspects of the problem: (1) measurement of dust concentration, (2) evaluation of the dust control program in terms of permissible dust concentration, (3) development of basic methods of design.

DUST DETERMINATION

The history of atmospheric dust determination extends over more than 100 years. The early investigations were concerned entirely with the living matter in the air, however, and it was not until the beginning of the present century that attention was directed toward inorganic dust in industry. Arens in Germany, and Haldane and Crichton-Brown in England published some of the first quantitative data. Earliest measurements of dustiness in the South African gold mines were made about 1902, but it was not until 1916 that the present extensive program of routine dust determination was inaugurated there. Since then thousands of samples have been collected annually in these mines. In the United States pioneer work was done by Ditman and Graham-Rogers, the latter carrying out investigations for the New York Department of Labor as early as 1909. The first American dust sampling instrument to be extensively employed was the Palmer water spray apparatus (1916) which was adopted as the standard instrument by the American Public Health Association, but this and other instruments were largely supplanted by the impinger introduced by Greenburg and Smith in 1922. This instrument has been used by the investigators in the U. S. Public Health Service in their comprehensive studies of the industrial dust hazard and the data thus collected represent the most complete information available in this country. Because of this fact the impinger has come to be regarded as the standard dust sampling instrument and is so recognized in courts of law and in state codes.

The impinger possesses many characteristics required in a scientific dust sampling instrument, such as high collecting efficiency against most industrial dusts, and unlimited loading capacity which permits its use in dust clouds of any concentration. It is a bulky and fragile instrument, however, not well adapted to rough work in industrial establishments. Moreover, the quantitative examination of the collected sample is time consuming and fatiguing. The practical phase of the dust problem —routine control involving large-scale sampling—is being featured today in place of the earlier scientific studies, and a real demand exists for a method of dust determination that is more convenient and rapid in operation than the standard impinger technic.

In the selection of a new method for routine work a high degree of accuracy is not important so long as the results are consistent among themselves. The purpose of dust determination is not to measure the absolute dust concentration but simply to obtain an index of the

health hazard involved in breathing the dust-laden air. Physiological rather than physical standards should therefore be applied in the selection of any technic. In this connection, it is to be observed that studies in the dusty trades have not demonstrated a high degree of correlation between dust concentration and degree of hazard. Thus, in the granite dust study of the U. S. Public Health Service it was possible to classify dusty operations only into broad groups, such as the following:

Group A—45 ± 25 million particles per cu. ft.
Group B—35 ± 15 " " " " "
Group C—15 ± 8 " " " " "
Group D— 4 ± 2 " " " " "

The same rough separation has been employed in other studies in the United States and in South Africa investigators have found it sufficient to classify dust counts, which they regard only as "figures of merit," according to the following scale: (1) <200 particles per c.c.; (2) 200–500; (3) >500; (4) <1,000; (5) >1,000. With respect to accuracy of dust determination, then, it appears to be unnecessary to distinguish between operations which show variations in dustiness of less than 100 per cent. Failure to recognize this low degree of required accuracy has led to the unwarranted condemnation of certain methods of dust determination.

A second characteristic which should be considered in the selection of a new technic is the limitation, if any, which it places on the volume of air from which the dust sample is taken. Much has been written about the relative merits of the so-called grab sample and the sample of large volume. The statistical distinction between them disappears when the duration of any sampling period is compared with the number of *years* of daily exposure to dust that is required to produce serious lung damage. In other words, a dust sample represents only the dust concentration at the sampling time whereas the dust in the lung is the accumulation over several years. In the United States, samples from 10 or more cubic feet of air are common, but in South Africa konimeter grab samples have been found to yield results just as closely related to the degree of damage observed among the exposed workers. As a matter of fact, South African investigators consider the "dust floods" of short duration to have greater hygienic significance than the average concentration, although the statistical evidence to justify this belief is limited. Regardless of the size of the sample, the important factors are the location, time and frequency of sampling, and these are matters for personal selection in each case. Thus, it may be said that the knowledge and experience of the investigator are of greater importance than the characteristics of the sampling instrument. A large number of properly spaced dust determinations of low accuracy may be more valuable than a few samples of the highest quality.

Undoubtedly, there is need for a universal method of dust determination which will yield comparable results in all industries and all countries, but for routine dust measurement as a practical control measure, local conditions should govern the choice of instrument. The impinger will continue to serve a very useful rôle but other instruments are also required. Practical dust sampling on a large scale is new in this country, and much more experience with different types of instruments is needed before standard methods can be adopted. At present many engineers are using the impinger with the mistaken idea that it alone will furnish proper information. Contrary to this, broad experience with different types of instruments is to be recommended in

order to secure the necessary information upon which to base our selection of standard methods of some later date.

PERMISSIBLE DUSTINESS

Minimum toxic doses for many poisonous substances encountered in industry have been determined by direct experiment, usually by exposing suitable animals to various concentrations of the substance and noting the results. The threshold dose has been established with considerable accuracy in many cases since it has been possible in these experiments to consider all important variables. Clearly, this experimental method can be employed only when the reaction to the toxic substance is clean-cut and rapid, with a well defined end point, so to speak. These requirements cannot be met in the case of silica dust and as a consequence animal experimentation is too expensive and time consuming to permit its use on the large scale required to produce the necessary data. The only scientific basis for determining the safe concentration of silica dust, therefore, is by direct investigation of the working conditions and the health of the workers in the dusty industries. Unlike laboratory experiments, it is not possible in field investigations to control many important variables. Conditions must be accepted as they are found and it is essential therefore that the conclusions reached from any one study be carefully limited. Several standards of permissible dustiness have been proposed as a result of such studies, but with respect to these a recent report from the British Home Office states that "such standards may be of value in estimating the relative efficiency of the methods used for suppressing dust in a single industry, but it would be wrong to adopt any of these standards as the measure of safety under different conditions and in other industries." This opinion is in direct agreement with the warnings sounded in the original reports from which such standards have come. Nevertheless, attempts have been made to plot a curve with the few values of permissible dustiness and associated percentages of free silica as coördinates and to interpolate or extrapolate from this curve to obtain the standard of permissible dustiness for any industry. The original studies are not in close enough agreement to warrant this, as is shown in Table I.

Of the several recommended standards, the only one which has been proved by actual experience is the South African figure. Over a period of 30 years the incidence of miners' phthisis has progressively decreased as the dustiness was reduced until the present when the dust concentration has reached 1 mg. per cu. m. and advanced silicosis practically has disappeared from the industry. It is interesting to observe that the South African standard was proposed more than 20 years ago, not as a minimum toxic dose, but as an engineering figure based upon conditions existing in the best mine in the area. That is, it was a practical level of dustiness that could be obtained by recognized engineering means.

Despite the uncertain value of any standard of permissible dustiness from the medico legal standpoint there is need for practical criteria to be employed by governmental and other agencies responsible for the health of workers in the dusty trades. It is the duty of these officials to say, for example, that according to the best knowledge available one method of control is satisfactory and another is not and for this purpose working standards must be developed. The South African experience suggests that the engineering, rather than the medical, approach to the problem should be followed. Thus, if by practical means, dustiness in

TABLE I

Standards of Permissible Dustiness

Industry	*Free Silica Per cent* *	*Recommended Safe Conc. Millions per Cubic Foot*	*Instrument Employed*
Gold-mining, South Africa	20–40	8 (or 1 mg. cu. m.)	Konimeter and Sugar tube
Sandstone drilling, Australia	80–90	5 †	Owens
Granite-cutting, United States	35	10–20	Impinger
Cement manufacturing, United States	6	10–20	"
Anthracite coal mining, United States			
(a) Hard rock	35	5–10	"
(b) Haulageway	13	10–15	"
(c) Coal getting	6	<50	"

* These figures are based largely upon examination of coarse cuttings and do not take into consideration the possible change in composition of the air-borne dust with particle size. Recent studies show that the great majority of the minute particles in the air-borne dust in South African mines, for example, are not quartz, but sericite. Thus, the Rand miners are not exposed to a dust containing 80–90 per cent quartz, as analyses of the "Banket" would indicate, but to dust containing as little as 20 per cent of free silica.

† Not based upon local studies but an estimated value arrived at from a consideration of data in other reports.

foundries can be reduced to 10 million particles per cu. ft. then this figure could properly be adopted as a practical requirement for the industry. On the other hand, nothing is gained and, in fact, the situation is confused if the dustiness standard adopted is beyond practical means of attainment.

There is a second reason for establishing a single standard for an industry rather than a sliding scale depending upon the composition of the dust—the practical matter of enforcement of regulations. The quality of inspection required and the amount of sampling and chemical analysis demanded by such a sliding scale would tax any inspection bureau beyond its capacity to perform the work and would greatly confuse the situation with respect to the matter of testing dust control apparatus for approval.

DESIGN OF EXHAUST SYSTEMS

Control of industrial dust by means of local exhaust ventilation is more common than by any other means. The basic principles of operation are the same in all exhaust systems but the details of design vary greatly from one installation to another. Exhaust ventilation has been widely employed for many years and most state codes have provided for regulations governing the design and operation of such equipment in their industrial codes. In the original development of these requirements special attention was paid to the collection of dust from grinding wheels and chips and shavings from woodworking machinery. In recent years, however, other dust producing operations having greater hygienic significance have demanded attention, and in applying local exhaust ventilation to them the limitations of the early specifications have taken on greater emphasis. A general revision of state codes governing exhaust systems appears to be necessary in order to meet the requirements of modern industrial hygiene.

In place of the empirical rules of design commonly employed in the

planning of exhaust systems, a more fundamental approach is possible. In this connection the following consideration of the problem leads to significant conclusions with respect to the problem of design of the exhaust hood, which is the most critical part of the system.

Dust dispersion—The purpose of local exhaust ventilation is to prevent the escape of dust from its source into the surrounding atmosphere. It is necessary therefore to destroy or effectively control the forces that cause dust dispersion. What are these forces?

Dust is thrown off from its point of generation into the air by the kinetic energy imparted to the particles during their formation, or it may be dispersed from a secondary resting place by some disturbing force which imparts velocity to the particles. The motion of a particle projected into still air is resisted by the air friction, which reduces the speed of the particle until it comes to rest at a distance S from its origin. At this point its kinetic energy has been completely destroyed; hence, we may write:

$$\text{K. E.} = \int_{vo}^{o} -mv\, dv = \int_{o}^{S} R\, dS$$

Where
m = mass of particle
v = particle velocity
vo = initial velocity
R = air resistance
S = distance of travel

The air resistance, R, is determined by certain well known equations which may be substituted in the above relationship and some practical values calculated.* When this is done one finds that whereas large particles (1 mm. in diameter) can be projected relatively great distances through still air, microscopic particles (of the order of 10 microns and less) are brought to rest in a distance which may be less than 2–3 cm. The practical significance of this is that for the dispersion of microscopic particles any real distance one must look for some force other than the kinetic energy of the particles themselves. This force proves to be air motion. Thus, the particles are thrown out from their origin into the air and the *dust laden air* is dispersed by convection currents and other forces that cause air movement. Hence, the problem of hood design, for the control of microscopic dust which is of greatest hygienic interest, is one of effecting control of the movement of the dust-laden air rather than of the dust itself. This is an important distinction since it leads at once to the first rule of design; namely, eliminate or reduce in magnitude all possible air motion around dust producing process; not until this is done, should the air flow through the exhaust hood be considered. The best treatment to effect this result is clearly indicated in many cases but requires extensive study in others. The value of such treatment cannot be doubted since in certain instances the required rate of air flow through the hood has been reduced 50 per cent and even more by this preliminary elimination of obvious sources of air motion. For example, the blast of air discharged against the cutting tool on the granite surfacing machine should be directed in another direction, thus greatly reducing the disturbance around the tool. The practical effect of this in one case was to reduce the rate of air flow required to capture the dust laden air from 400 cfm. to approximately 200 cfm.

Required air velocity to capture dust laden air—No matter how completely one removes the sources of air motion around dust producing machines all

* For a more complete treatment of this problem see: Design of exhaust hoods for dust-control systems, by Theodore Hatch. *J. Indust. Hyg. & Tox.*, Nov., 1936.

movement cannot be eliminated and it is still necessary to control the residual air motion. This is done by means of the air flow into an exhaust hood which creates within the zone of dust production air velocities toward the suction opening of sufficient strength to stop the outward movement of dust laden air, to change its direction, and to cause it to flow into the exhaust system. The air velocity necessary to accomplish this cannot be given with any accuracy, but some useful data are available which are of assistance to the designer in making his estimate. Velocities vary from 50 fpm., representing the minimum necessary to overcome natural convection currents, to several hundred feet a minute for a very active dust producer. According to the recent code adopted in Wisconsin, the minimum air velocity to be maintained in the zone of dust production is 500 fpm. This is a high value; probably a closer average is 200 fpm., but the actual velocity should be estimated for each case, or better, should be determined experimentally. In the case of the pneumatic hand tool in the granite industry, for example, it has been found that a minimum velocity of 200 fpm. is required to insure steady flow of all the dust laden air toward the suction opening. Experiments on a bagging machine showed that 400 fpm. is required to draw the contaminated air away. These are fundamental specifications upon which the hood design should be based. To date, air velocity requirements have been determined for only a few processes.

Rate of air flow into the exhaust hood—The air velocity necessary to capture the dust laden air can be created by air flowing into any simple suction opening provided the rate of air flow is high enough. A properly shaped hood, correctly located, must be used, however, if the device is to operate at maximum efficiency, *i.e.*, if the percentage of flow from the area of dust production is to be high and the flow from ineffective areas kept at a minimum. Even with the best design, exhaust hood efficiency is relatively low but with careful attention to certain basic laws governing the flow of air into suction openings, the efficiency can be increased significantly over common values.

The development of certain aerodynamic laws governing the flow of air into suction openings and their graphic presentation by DallaValle constitutes one of the most important recent advances in hood design. Based upon these laws, DallaValle has also developed equations for calculating the required rates of air flow necessary to create the desired air velocities around certain dust producing processes. The use of these equations and their further development offers a basic approach to the problem of hood design although it is not expected that mathematical calculations alone will solve the problem of hood design for every situation.

The simplest case is that of an unobstructed hood located a definite distance from a concentrated point of dust generation. If the required air velocity at the tool is known, the air flow through the hood can be calculated at once from the equation:

$$Q = V(10X^2 + A)$$

Where

Q = rate of air flow through the hood, cfm.
V = required velocity at the point of dust generation, fpm.
X = distance from face of hood to tool, ft.
A = area of face of hood, sq. ft.

Another simple case is one which permits the location of the dust producing operation wholly within an exhaust booth. By experiment it is possible to determine the minimum face velocity necessary to prevent the outward movement of any contaminated

air from the booth. Thus, Q may be calculated by means of the simple relationship:

$$Q = VA$$

Where A is the cross-sectional area of the booth at the plane for which V is known.

The rate of air flow into an enclosing or partially enclosing hood cannot be calculated directly since it is difficult to specify minimum air velocities required at well defined areas. Two conditions must be maintained: (1) the air velocity must be sufficient through openings in the enclosing hood to prevent the outward escape of dust; (2) development of sufficient air motion within the enclosure to prevent undesirable settlement of dust, but in certain cases this velocity must not be so high as to lift and carry away valuable product.

When direct calculations fail to give the necessary rate of air flow for a particular problem it is necessary to resort to experimental determination of this value. The process is isolated from other dust sources and operated with model hoods. The ventilating rate is varied and for each rate of air flow the resulting dust concentration is determined. From the curves thus developed, the most efficient hood can be selected and the minimum rate of air flow *for this particular hood* established. Direct investigation in this way may be relatively costly but the experimental study will frequently pay for itself through the more efficient and economic design thus secured.

A very large percentage of hood design problems are not well defined and must be based upon such experimental studies. Data thus obtained will be required in the development of industrial codes for many machines and processes. The collection of such information should constitute one of the most valuable functions of the engineers in the divisions of industrial hygiene in the various states.

Industrial code specifications for exhaust hoods—From the foregoing, it is clear that the air velocity created by an exhaust hood over the area of dust production is the most important index of hood operation. So far as possible, therefore, industrial codes should be written around this basic specification—since it is independent of the design or location of the hood itself. When this is not possible the minimum rate of air flow should be specified but, in this case, it is also necessary to specify the hood design since it is the combination of the two which determines the efficiency of dust control and not the rate of air flow alone.

In most industrial codes the air flow requirement is determined from a certain value of static suction at the hood throat. The relation between the two is given by the equation:

$$Q = 4000\, A\, f \sqrt{SP}$$

Where

Q = rate of airflow through the hood, cfm.
A = area of pipe at the hood throat, sq. ft.
f = coefficient of restriction which varies with hood design.
SP = static suction at the hood throat, inches of water.

One notes that Q is a function of A and f as well as SP. The branch pipe size is commonly specified but f is generally assumed to have a value of 0.7. This is simply an average value; the coefficient may vary from 0.3 to 0.95, a variation of over 300 per cent! Recently the velocity pressure in the branch pipe has been proposed as a more accurate measure of hood operation since with it the variable coefficient, f, is not required to calculate Q, thus:

$$Q = 4000\, A \sqrt{VP}$$

An important disadvantage of this index compared with the static suction

reading is that a great deal more skill is required in its determination.

Basically, neither the velocity pressure nor static suction in the branch pipe should be employed as a primary index since a high value does not necessarily mean high efficiency of dust control. The velocity in the branch pipe should be no higher than that required to transport the dust; any increase over that velocity simply means wasted energy. It is not the manner in which air moves within the exhaust system but rather the manner in which it flows *into* the hood that governs the efficiency of dust control.

Based upon modern concepts of the requirements of exhaust systems, specifications for design might properly include the following items:

1. The exhaust hood shall operate in a way so as to reduce and maintain the dust concentration below a certain permissible level. Many existing codes require the removal of "all" dust. This is practically impossible and should be so recognized in the code.

2. The exhaust hood shall be of such design and the air flow through it shall be maintained at such a rate that the air velocity created over the area of dust production shall be not less than a certain specified value.

3. Because of limitations imposed by the process it may be impossible to specify the minimum air velocity, as in item 2. In these cases, state the minimum rate of air flow into the exhaust hood but include, in addition, certain basic specifications governing the design and location of the hood itself.

4. The designing engineer may properly object to rigid requirements which discourage him from developing more efficient hoods. In order to encourage new developments, the code should provide for exceptions to the requirements of item 3 and allow the use of other types of hoods which are approved by actual test. This provision is important since it is desirable to foster research and the use of more basic engineering factors in the design of exhaust systems.

5. A minimum velocity in the exhaust piping should be specified in order to insure continuous removal of the collected dust. This velocity and the required rate of air flow together will determine the size of the branch pipe and the velocity pressure to be maintained in it. The static suction will also be determined if, in addition to these, the coefficient of restriction for the hood is also given. It is important that one of these indices be known because they constitute the best practical measure to be employed in the field by the inspector who is responsible for the proper operation of an exhaust system. They should be determined however from other more fundamental specifications, and not appear themselves as primary requirements.

Inaugurating Grade A Pasteurized Milk in the City of Chicago*

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MEDICAL science is a vital, moving, progressive force which, in a large city, affects the well-being of every person.

Ordinances and statutes covering health matters, of necessity, from time to time must be altered in view of the progress through scientific endeavor. Nowhere has this been more clearly shown than in the history of the ordinances designed to control milk supplies.

The need for the tuberculin testing of cows, the need for better sanitation on dairy farms, the growth of large cities making it necessary that milk be shipped over long distances, are but a few of the factors which have made changes in the milk ordinances necessary.

Unfortunately, the amending of ordinances does not always give a satisfactory law. There are apt to be contradictory passages. Definitions, unless clearly set forth, are apt to differ in the minds of those who propagated the original ordinance and those who add the amendments. The ordinance for the control of milk supplies under which Chicago was operating up until 1935, was of this type. Various amendments had been made to the original from time to time, adopted evidently for the purpose of incorporating new ideas in milk sanitation, or because of legal necessity demonstrated by court trials. In 1934, the city of Chicago was involved in a lawsuit in which the reasonableness of the milk control laws was attacked. Fortunately, the plaintiff's case was weak and the city won the suit. However, during that trial, it was clearly demonstrated that in Chicago the existing milk control laws were wofully weak and dangerously insufficient. Since the ordinance was not similar to any standard ordinance and was unlike ordinances in other parts of the country, it was difficult to establish in the mind of the court its approval by scientific bodies. It is likely that the same condition exists in many American cities today.

The manner in which milk ordinances are formulated often makes certain provisions in them contradictory. After an ordinance is passed, frequently years later it is amended and re-amended, and the amendments may contradict provisions of the original. Should the ordinance be attacked, the court has difficulty in arriving at a decision. Moreover, enforcement of the ordinance is difficult when there are contradictory provisions in it.

It was discovered that the ordinance under which Chicago was operating was of this old, often amended type. These numerous amendments weakened the ordinance as a whole. Close systematic inspection of farms and plants was not provided for, and enforcement agencies

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

were given a false sense of security. Further, the contradictions made it almost impossible to defend the ordinance in the courts.

At the conclusion of the trial referred to, we recognized that there was need for a complete change in the laws governing the sanitation of milk supplies. After a careful study of the existing ordinance with its amendments, it was not deemed feasible to attempt alterations to make it fit conditions. We concluded that the wisest procedure was to set up the best possible ordinance and to alter the conditions under which milk was produced and handled to fit the ordinance, instead of attempting to change the law to fit conditions which then prevailed.

1. It is our opinion that a milk ordinance, to be workable, must first have been tried out and shown to be legal in all its aspects and, therefore, able to withstand the test of court trials.

2. It must include all of the modern practices for the control of milk supplies, if these practices have been tested and found workable.

3. The ordinance must be sufficiently flexible so that changes to include legally the latest developments in milk sanitation may be easily brought about, but not be so flexible that improper interpretation is possible.

4. It must be complete in all details so as to permit a uniform enforcement in all areas. This is of particular importance in a milk shed which is as large as that of Chicago.

5. It should be so constructed that at all times it is possible to determine whether or not it is being adequately enforced. There should be a definite yardstick by which to measure enforcement.

In other words, the rules and regulations must be so clearly outlined that it is easy for inspectors uniformly to determine conformity with the provisions.

We found that the standard milk ordinance of the U. S. Public Health Service included these 5 requirements. It was, therefore, prepared for adoption after making certain upward revisions.

The sale of milk and milk products, including the ingredients of ice cream, was limited in Chicago to grade A pasteurized and certified milk and milk products.

A time limit was placed on the sale of milk and cream to insure their freshness, making storage for any great length of time illegal. A schedule of license fees was included.

On December 12, 1934, this ordinance was presented to the City Council and was referred by that body to its committee on health. Following a public hearing before this committee, at which milk producers, distributors and consumers approved of it, the ordinance as prepared was reported favorably back to the City Council who adopted it unanimously January 4, 1935.

On January 8, 1935, the Board of Health of the city of Chicago adopted the U. S. Public Health Service Milk Code as regulations for the interpretation of the ordinance. It is obvious that no matter how ideal an ordinance may be, unless it is adequately enforced, its value is lost. The enforcement officer must be completely familiar with the ordinance he is attempting to enforce and must understand exactly what constitutes compliance.

He must be courageous and, most important of all, he must be backed up by a courageous mayor or other governing officer who is in sympathy with the purpose of assuring a pure, safe milk supply for the citizens, and will resist outside interference for personal gain. Chicago's chief executive has given his whole-hearted support to seeing to it that there has been no interference with its enforcement. Should a health offi-

cer know in advance that he will not be able, without interference, to close the largest and most influential dairy farm or pasteurization plant because of the violation of any one or more grade A items, it would be well for him to have the ordinance include the power to degrade a supply as well as the power to revoke permits.

The direct enforcement officers of a milk ordinance are the inspectors. Therefore, a school was established to instruct the field force in the details of the ordinance and code so that the enforcement would be uniform, each inspector using the same yardstick in determining compliance. The field inspection forces of milk distributors' and producers' organizations, and all others interested in the enforcement of the program, were invited to attend the school. In this way we felt that all interpretations of the ordinance and code would be as uniform as possible.

So often when violations of ordinances occur, they are due to a lack of understanding of the provisions by those who have violated them.

New ordinances which are passed are given varying amounts of newspaper publicity. After the passage of an ordinance, publication is required in the official newspaper of the city, but unless a direct effort is made to inform all those concerned of the passage of such an ordinance, there would be many who would continue to operate in ignorance of its provisions.

Often there is a lack of sympathy with the provisions of an ordinance by those whom it affects because they do not understand it, and are not made aware of its purpose.

Since the passage and enforcement of the grade A ordinance in Chicago, as the dealers and producers have become better acquainted with the purposes behind it, they have become more and more favorable to it because it brought improvement in their products and helped stabilize their market which meant increased sales.

Immediately after instruction of the inspection force, plants and farms were visited by the inspectors to teach both producers and distributors the requirements of the ordinance and the regulations of the code. This was carried on as rapidly as possible but the inspectors in urging enforcement were advised to use all possible diplomacy.

However, it consumed some time because each inspector was impressed with the need of thoroughly explaining each item and for helping the producer and distributor to comply with as little expense to them as possible.

In public health work, after years of experience, I have been impressed with the fact that when starting on a program it is usually pushed forward with enthusiastic effort; but, like a pendulum, the enthusiasm with which the new project is launched gradually drops away. Then, often a new project is taken up and the others are forgotten. So it is in a milk control program. It is necessary to hammer away continually at enforcement else gradually violations occur, and soon the major provisions become non-operative.

When the first inspection sheets under the new milk ordinance were received, it was evident that efficient milk sanitation did not prevail and that the adoption of the new program was not only wise, but necessary.

The first inspection rating of the Chicago pasteurized milk supply, based on the survey standards of the U. S. Public Health Service, showed only 59 per cent compliance, while we had believed it to be better than 90 per cent.

What was to be done in order to bring about compliance? Three things were necessary: (1) to find out where corrections were needed, (2) to order that such corrections be made, and (3)

to see that the corrections were carried out.

We felt that to carry out successful control of the milk supply, a complete record filing system was necessary. Therefore, we adopted the system which included all of the features of the ledger plan used by the U. S. Public Health Service, but set it up as a visible card system, because of the large number of records involved. By means of this plan we can accurately tell at a glance, violations on any farm, or pasteurizing plant, and can then bring about rapid correction of unwholesome conditions due to laxity on the part of the producer or distributor. After setting up this record system and making reinspections, most of the farms and plants were willing to make the needed improvements. Every possible assistance was given to those who were inclined to coöperate, so that they could rapidly complete the remaining improvements.

Those who refused to make any corrections (a very small number) were excluded from the Chicago market.

The conditions on farms supplying cream-producing plants were originally not as satisfactory as on those in the milk producing area. It was found advisable to delay the grade A announcement on cream until August 1, 1936. This gave the farmers an opportunity to make necessary improvements without upsetting the market. By August 1, 1936, conditions on the farms had been brought up to a satisfactory level.

Our work in the control of milk and its products is rapidly nearing a stage of completion. This does not mean that we can sit back and that no further control is necessary. Continued inspections, reinspections, and constant vigilance are necessary if the grade A standard is to be maintained in the face of competition as keen as it is in the dairy industry. However, the groundwork has been laid on a firm foundation which will not be easily shaken.

One of the health officer's main weapons in milk control is proper pasteurization, and by that is meant proper pasteurization of every drop of the milk, including the foam. It means that every drop must be brought up to the temperature required and kept at that temperature for the required time.

With the methods of milk production now demanded, together with thorough and efficient pasteurization, we feel that our milk supply is safe and wholesome. A 16 per cent reduction in the infant mortality rate occurred in Chicago during 1935, and the general death rate remained at a low level. We feel that the improvement in the milk supply was at least a factor in this reduction.

The standard ordinance adopted was shown to be so flexible that when unusual situations were encountered, it was not necessary to amend the ordinance to cover them.

For example, it was thought advisable, in order to permit better inspection, to require that all milk and milk products sold in Chicago be pasteurized in Chicago and Cook County, and this could be required without amending the ordinance. Further, the elimination of all milk and milk products in bulk, except those used for manufacturing, was found advisable, and this too could be carried out without any change in the ordinance.

The cost of enforcement has not been high and we have reached the point where producers, distributors, and consumers are satisfied with the results. Many of the farmers and dealers who were in doubt as to the success of their business under the new ordinance are now in complete accord with the program.

We maintain that proper pasteurization is the front line defense against milk-borne disease, and it is a defense

which can never be allowed to waver or break down.

SUMMARY

1. The formulation and enforcement of an ordinance based on the standard milk ordinance of the U. S. Public Health Service, permitting only grade A milk and milk products, can be carried out in a large community.

2. A well trained, tactful, sympathetic group of inspectors will do much to make enforcement possible without producing antagonism on the part of dealers and distributors.

3. The grade A ordinance, since it brings improved products, will necessarily bring better returns for the effort expended.

4. The enforcement of any ordinance requires courageous health officers, backed up by a courageous mayor or other governing officer who is in sympathy with the purpose of the ordinance. This is nowhere more true than in regard to a milk ordinance.

5. Proper pasteurization is the first line of defense against milk-borne disease, and enforcement of all pasteurization requirements should be maintained at all times.

NOTE: A survey made by the U. S. Public Health Service in January, 1937, of the milk and milk products supply of Chicago showed a compliance rating of 97 per cent. This rating indicates the improvement made after the first survey as reported in this paper.

Medical Interest in Gas Masks

PRECAUTIONS for the defense of the country against air attacks are being rapidly made on a large scale. Those against gas attacks are particularly of medical interest. Masks of three main types are being made. The first is the standard army service type and can be worn for 48 hours without adjustment. This will enable men engaged in decontamination work, casualty evacuation or the control of any of the essential services in areas where the concentration is heavy and the hours of service long and continuous to carry on with perfect confidence. The construction of the mask is simple and it is guaranteed effective against any of the poison gases at present known to the government, excepting such vesicants as liquid mustard and lewisite, for which special protective clothing must be worn. The gas masks for the civilian population are of a different type and are designed to cause less resistance to breathing. For this and other reasons they can be worn without discomfort by elderly persons and by children over the age of 4 or 5 years. These masks are of two kinds, one good for from 6 to 8 hours, the other for 3 or 4 hours. The former mask, called the service type, is intended for those on special duties, such as stretcher bearing, point duty and shifts in factories and public works. The latter type, called the standard civilian mask, which is being produced in large quantities, gives sufficient protection for the civilian to take cover in a gas-proof shelter or to escape altogether from the danger zone. Students are being trained in the use of these masks as well as in anti-gas preparations in general.

The government is experimenting with three types of gas mask for small children. One is a portable cradle with a complete cover; the second is a special hood which completely envelops an ordinary perambulator; the third is a box in which a baby can sleep soundly.

One or all of these types may be adopted and issued to the public free. —London Letter, *J.A.M.A.*, March 27, 1937, p. 1130.

Practical Aspects of Public Mental Hygiene*

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KNOWING that all public health work, including public mental hygiene, depends so much on prevailing social and economic conditions, I could easily describe an ideal state in which mental health work would be unhampered and at a high level, but that would be impractical and not in keeping with present circumstances and with the solving of our problems at hand. When I was asked to speak before this meeting I was told that we were concerned with the necessity of incorporating definite practices through existing health agencies for the prevention of mental disease on a large scale.

Interested in mental hygiene, which, even in therapy, consists more of prevention than of real treatment, I have departed somewhat from psychiatry, which is inclined to deal more with the developed psychotic cases. Both from my clinical work here and abroad and from my own private practice I have learned the need of a public and social approach in all mental health matters. We cannot separate the individual, his mind, his adjustment, or lack of adjustment, from his environment, past and present. It is impossible, therefore, and entirely useless to attempt to prevent mental diseases from the public or personal standpoint without taking into consideration the station in life of a given person or a group, the family relationship, the upbringing, the occupation, the intellect and education, the race and nationality, the near and remote past. None of us has fallen from the moon; each one of us is a tiny ring in a long chain, and our reciprocal interdependence is infinite.

That is why I believe that the theoretical, generality or pioneering or infancy, or groping, trend of mental health must give way to a more mature period and that it is about time that the health agencies study and understand mental hygiene from a public viewpoint and take over its problems. They have been ignored too long. So far and on the whole public health men have failed to see their importance. Indeed these problems are just as momentous as those related to communicable diseases. It would certainly not be an exaggeration to maintain that mental diseases are sometimes even more contagious than the somatic ones.

In this country the mental hygiene movement was founded, at the dawn of this century, by a splendid man, who, after being hospitalized as a psychopath and having suffered much from mistreatment in institutions, managed to be cured and fight his way out of the insane asylum. He was helped in his

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work by psychiatrists. It was natural, then, that the mental hygiene movement should from its inception take the form of a struggle for the improvement of the hospitals for the insane and of the condition and treatment of the insane. He had had a great forerunner, Pinel, who, 100 years before, had taken, so to say, the part of the misunderstood and persecuted and tortured mental patient and, at the risk of being ridiculed, had given to the world a new idea about insanity.

The modern Frenchman, Dr. Toulouse, who started his work at about the same time as Clifford Beers here, and who is still active along the same lines in Paris, has had another conception of mental hygiene, which he properly calls mental prophylaxy, that is, prevention of mental diseases or rather conservation of mental health.

There is a need for a re-definition of mental hygiene. It is not psychiatry proper and should not be regarded as such. It is not therapy, but prevention of mental diseases or, like all hygiene, treatment before or almost before the disease appears or develops. It has nothing to do with hospitals for the insane or with the manner in which the psychopaths are treated there. It is not a fight for the amelioration of such institutions, although this may be a necessary work also.

Mental hygiene is a part of general hygiene and public mental hygiene is a public health work—in the same sense as general personal hygiene is not private medicine and public health is not hospital treatment.

Mental health or the prevention of mental disease is closer to general public health than to psychiatry and medicine, although it is helped by both. And no public health work is complete or rounded out if mental hygiene, understood in a new fashion, is disregarded and excluded.

What, then, can public and official health agencies do for the prevention of mental diseases? Very much—and large and heavy programs might be detailed. But here I only wish to indicate as briefly and sketchily as possible a few of the feasible works as instances of what health authorities might undertake. These examples are meant to stimulate further practical suggestions by other workers.

To begin with, it is necessary to be informed about the worthwhileness of mental hygiene. Without being deeply convinced about its importance nothing can be done or it would be done half-heartedly. Then we must become interested in what I call the *transition cases*, those between mental health and mental disease, where prevention is still possible. As there is no definite boundary between health and disease of the mind, the cases of people who have begun to be unadjusted are to be found everywhere. They are extremely abundant and many are amenable to improvement if approached in the right manner and about 50 per cent of them, I claim from past experience with them, are curable. This is a broad and beautiful and fertile field, of much greater significance than that of the advanced cases. It has been comparatively neglected because it has been in the care of psychiatrists who are the greatest of medical men, but who usually are not health minded, who do not have the public health point of view and are less interested in the transition cases than in the advanced ones.

I would advocate, therefore, preventive mental centers for adults conducted by health departments. I purposely would not call them clinics because they would really not correspond to what is commonly known by that word. They should be in the hands of special, or a novel type of, psychiatrists, who would be willing to work in a new spirit and

with a new vision, that of prevention and that of having in mind the place of the individual in his group and in society. The function would create the organ. Naturally, they would have to be sympathetic and entirely absorbed in the study of these cases and their environment. Of course, these centers would have to be connected with other public agencies whose object it is to solve or settle various individual problems, like courts, schools, parents' associations, trade unions, etc.

As child upbringing, sexual problems in all ages, but particularly in adolescence and youth, marital conflicts, industrial and economic difficulties, social frustrations, contribute enormously to mental maladjustment or constitute its worst causes, every public health agency should turn its attention to these matters.

There should be a mental hygienist in each elementary or secondary public school of some appreciable size, one for a few smaller schools and several mental hygienists employed in each of the larger schools.

All pupils should be examined mentally once during their entrance year, reëxamined if abnormalities are discovered, and a record kept about the findings. Irregularities should be discussed with the parents and the teachers. Behavior problems should be solved—or an attempt to solve them made—in coöperation with the parents, who would be instructed to report them. Very often it is their mistakes rather than those of the child that must be corrected and it is they who must be educated. Similar work is being done even now here and there, but insufficiently and not systematically.

The professional teachers' colleges should pay more attention to the study of child psychology and children's mental health. Health departments might be influential along such lines.

The child guidance clinics which were opened some years ago and functioned rather successfully in many places have been partly abandoned and partly shorn of their efficiency in the lean years. They should be revived, improved, and multiplied.

Easy courses in child upbringing for parents and future parents should be opened, preferably in public school buildings—always with a view of teaching possible mental disturbances and how to avoid conflicts which may lead to maladjustment.

Free marital consultation bureaus should be founded by health departments and all populated centers dotted with them. They should not be compulsory and should work in a rather friendly, sympathetic, and confidential way, trying to deal with the problems of young men and women who are willing to come for advice before marriage. These young people would be questioned, examined, and advised. As much as possible those originating from families in which insanity or feeblemindedness prevails would be discouraged from mating with those born into similarly handicapped families—both in their own interest and that of the community, it would be explained to them. The existence of such bureaus would also have a salutary and educative effect upon the people at large. At the same time, cases of gonorrhea, syphilis, and tuberculosis would be discovered and treated in marriage candidates. Other bad and evident mismating might be avoided. The effect of such bureaus would amount to a sort of modified eugenics. They would also give birth control instructions in appropriate cases and where that would be absolutely necessary in order to prevent possible mental misfits.

Several years ago I observed the work of the highly efficient and free Heiratsberatungsstellen of Vienna founded by

the late Professor Tandler and now all but wrecked. It was a worthwhile work that we should imitate and perfect.

As the various school authorities are rather reluctant to teach the necessary sexual facts to adolescents, public health agencies should undertake this work and open classes for young people where such instruction would be given. Dispelling the common fears and anxieties which are due to ignorance and misinformation, and lead to mental maladjustment and disorders, should be one of the greatest duties and one of the most useful functions of the health authorities. It would not only prevent mental troubles to a large extent, but it would prevent a good deal the spread of venereal diseases which are among the causes of mental disorders. It would also contribute toward a better life with fewer conflicts between married couples—and consequently again toward a diminution of mental disease.

All health departments have, sometimes on paper only, sections on industrial hygiene. They should not only become generally more efficient than they have been in the past, but should be interested in the mental aspects of the workers as well. Public health agencies should enlighten the employers, large and small, that it is to their own advantage that the workers be clear-minded, alert, and calm, in order to avoid accidents, to produce more and do better quality work. That is, of course, connected with the avoidance of overwork; with the distribution of the work so that the number of the unemployed be diminished; with more time for leisure for those employed, with improving working conditions all around. Physical over-fatigue goes hand in hand with mental over-fatigue, and economic insecurity is one of the frequent causes, or predisposing causes, of psychosis.

On the other hand, public health agencies should also keep in contact with the trade unions and gain their coöperation so that some mental hygiene teaching might be possible through them in relation to industrial conditions.

Although alcoholism has its roots in social life, an intensive educational campaign against it should be inaugurated and waged unceasingly, as alcohol is one of the purveyors of mental diseases. This is easier to do now than it was during the prohibition years when it might have been suspected as of political or selfish significance.

Educational instructions and campaigns should not be of the "Don't Spit on the Floor" type or in the form of an order to be obeyed blindly. No one coöperates with such orders, because they are not convincing. Reasons must be given and the interest of the people, nay, even their enthusiasm must be aroused.

Mental hygiene should penetrate all our public health work. The more of mental disease we prevent the greater our help to humanity.

Let us get rid of as much as we can of the blighting, ruining mind troubles so disseminated that there is hardly a family entirely devoid of them. They make our people miserable, helpless, and unhappy, and prepare further mental decay for the next generations. Let us get as close as possible to their causes. Let us free society from their strangle-hold and allow it to think more normally and rationally and work its way toward a greater happiness.

Observations Upon the Practical Value of the Complement-Fixation Test in the Diagnosis of Amebiasis*

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IN 1929, the writer described a technic for a complement-fixation test for the diagnosis of amebiasis and in later contributions (1930, 1931, 1933) detailed the results of the test in human infections, and, in conjunction with Kagy (1933), the results obtained with it in experimental infections with *Endamoeba histolytica* in dogs, results which were practically identical with those obtained in man.

Since the discovery by the writer that complement-fixation can be used as a diagnostic procedure in amebiasis, the occurrence of this phenomenon has been confirmed by numerous observers (Menendez, 1932; Spector, 1932; Heathman, 1932; Sherwood and Heathman, 1932; Tsuchiya, 1934; Weiss and Arnold, 1934; Meleney and Frye, 1935; and Stone, 1935), and the test has been employed as a routine by the writer and others in the diagnosis of infection with *E. histolytica* with excellent results. The writer has employed the test in diagnosis for a period of over 8 years, during which time over 1,500 individuals have been tested, and positive results have been obtained with it in approximately 18 per cent of those examined, the rather large percentage of positive reactions being due to the fact that more than three-quarters of those tested had either lived in highly endemic regions or were patients in hospital suffering from gastrointestinal disease. Of 1,000 individuals in whom the results of the complement-fixation test were checked by a stool examination, 175, or 17.5 per cent gave a positive reaction, while 825 individuals, or 82.5 per cent, gave a negative reaction. Of the 175 positive cases, *E. histolytica* was demonstrated in the stools in 157, or 89.7 per cent, while of the 825 individuals giving a negative reaction, only 12, or 1.4 per cent showed this parasite in their feces. Of 676 negative individuals with this test, no less than 220, or 32.5 per cent, were infected with other species of intestinal protozoa, and no less than 176, or 25.1 per cent, were infected with some other species of intestinal ameba.

The complement-fixation test, employing antigens made by the extraction of *E. histolytica* with alcohol is apparently as specific for amebiasis as is the Wassermann test for syphilis. It does not give false positive results with

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the blood serum of individuals infected with other species of intestinal amebae or flagellates, nor does it give a positive reaction in individuals suffering from other disease conditions, so far as is known. False positive reactions may occur with this test, as with every other serological procedure, but the percentage of such reactions must be very small and of little practical importance. A careful check of the feces in cases giving a positive reaction has almost invariably shown the presence of *E. histolytica* although sometimes repeated fecal examination must be made before the parasite is demonstrated. As important proof of the specificity of the test is the disappearance of the positive reaction after the elimination of the infection by treatment, the reaction usually disappearing within 2 weeks after the cessation of treatment if the infection has been eliminated.

The test gives positive results not only in cases of acute amebic dysentery but also in carriers of *E. histolytica,* with or without symptoms, and in cases of amebic abscess of the liver which have developed after the intestinal infection has spontaneously disappeared or been eliminated by treatment.

While the practical diagnostic value of the complement-fixation test for amebiasis is great, it should never be employed in preference to a microscopical examination of the feces for *E. histolytica,* when such an examination can be made by one experienced in the differentiation of this ameba from the other intestinal amebae of man. It has been the experience of the writer that repeated examinations of the feces will almost invariably result in the demonstration of this parasite, if it be present, except in those in whom an abscess of the liver or other organ has developed after the intestinal infection has disappeared, as sometimes happens; and repeated microscopical examinations of the feces should always be made before resort is had to the complement-fixation test in the diagnosis of amebiasis.

When expert microscopical examination of the stools for *E. histolytica* is impossible, the complement-fixation test will be found most useful in the diagnosis of "carriers" of the parasite; in suspected cases of amebic abscess of the liver or other organ; in acute or chronic dysentery of undetermined origin; in surveys to determine the incidence of infection with this parasite; and as a control measure in the treatment of amebic infection.

The Diagnosis of Carriers of E. histolytica—It is most fortunate that the complement-fixation test gives strong positive reactions in most "carriers" of *E. histolytica,* even in the absence of appreciable symptoms of the infection, and it has been the experience of the writer that a higher percentage of positive results has been obtained with this test in "carriers" than in those suffering from acute amebic dysentery. It has also been his experience, using antigens prepared from cultures of strains of *E. histolytica* producing both large and small cysts, that positive results are obtained with both in individuals whose feces show large or small cysts, contrary to the experience of Spector (1936) who states that she found that antigens prepared from cultures of a strain producing large cysts did not react with the blood serum of individuals infected with strains of the parasite producing small cysts. In our experience no difference has been found in the reactions produced by such antigens in individuals showing either large or small cysts of *E. histolytica,* either in man or experimental infections in dogs, nor have we been able to demonstrate any difference in the pathogenicity of such strains in experimental infections in kittens or dogs.

In the diagnosis of "carriers" and

mild symptomatic infections with *E. histolytica* the complement-fixation test is of great practical value, and routine tests made upon all patients entering hospital very frequently result positively in patients whose stools would never have been examined for this parasite owing to absence of suspicious symptoms or the presence of some other disease.

The Diagnosis of Amebic Abscess of the Liver—The complement-fixation test for amebiasis usually gives a positive reaction in cases of amebic abscess of the liver, and in this condition it is often of diagnostic value, as when the symptoms are vague or only suggestive, or the stools are negative for the parasite and a suspicious history and symptoms are present. It should be resorted to in suspicious cases even though the stools may prove negative upon expert examination, for sometimes abscess of the liver may occur after the intestinal infection has disappeared, either spontaneously or as the result of treatment. The writer has observed instances in which repeated stool examinations were negative for *E. histolytica* but in which the complement-fixation test was positive and the clinical symptoms suggestive of abscess of the liver. In these instances operation revealed the presence of an amebic abscess of the liver and *E. histolytica* was demonstrated in the scrapings from the wall of the abscess cavity.

In one instance the patient had been operated upon for empyema but as a routine complement-fixation test for amebiasis gave a positive reaction, it was thought that perhaps the empyema might have been caused by the rupture of an amebic abscess of the liver into the pleural cavity, and surgical exploration demonstrated the presence of a large abscess cavity in the upper lobe of the liver which communicated with the pleural cavity and from which the pus originated. In this case *E. histolytica* was demonstrated in the patient's stools after the positive complement-fixation test was reported, and it was also found in scrapings from the liver abscess wall. Such instances prove how desirable it is to employ this test in suspicious cases where the stool examination is negative.

The Diagnosis of Acute Amebic Dysentery—In acute amebic dysentery and in the acute exacerbations of chronic amebic dysentery the complement-fixation test is a valuable diagnostic agent. While the symptomatology of typical acute amebic dysentery is quite characteristic, many atypical cases occur, and it is believed that the statement that a correct diagnosis of this form of dysentery is impossible without the demonstration of *E. histolytica* in the stools will be concurred in by the vast majority of clinicians. Fortunately, the large, active trophozoites of this parasite are easily recognized by one well trained in intestinal parasitology, and the presence of such trophozoites containing red blood corpuscles is diagnostic of amebic dysentery. However, when stool examinations are impossible the complement-fixation test should be employed, for this test gives a positive reaction in at least 90 per cent of cases of amebic dysentery, in the writer's experience.

The possibility of a combined amebic and bacillary infection should not be forgotten for such combined infections are by no means rare, and a positive complement-fixation test for amebiasis, or even the demonstration in the stool of *E. histolytica,* does not always prove that the dysenteric symptoms are caused by the ameba. Much confusion has resulted in the description of the symptomatology of amebic and bacillary dysentery because of such combined infections and, if possible, every case of dysentery should be studied bacterio-

logically, even though *E. histolytica* be found in the stools.

The Diagnosis of Amebic Infection in Surveys—Under certain conditions the complement-fixation test for amebiasis may be of service in surveys to determine the incidence of occurrence of this parasite, but the test should not be used for this purpose if it be possible to examine the feces properly. It may sometimes happen that trained personnel for this purpose is not available where surveys are desired, and, if not, it would be practicable to collect blood serum and send it to a laboratory for the complement-fixation test. So far as the writer knows, the test has never been used in surveys but, under the conditions mentioned, it should prove of practical value in epidemiological studies.

The Control of the Results of Treatment—Not the least valuable feature of this test is its possible use in the control of the results of treatment of amebiasis with various drugs. A positive reaction with this test becomes negative after the elimination of infection with *E. histolytica,* usually within 2 weeks after the disappearance of the amebae from the stools. If the reaction remains positive, even though the amebae have disappeared from the feces, it has been found that the organisms again appear in the stools within variable periods, so that the continuance of a positive reaction indicates that the infection is still present although the amebae cannot be demonstrated in the feces. In fact, in some cases which became negative both for the parasite and serologically, a return of a positive reaction has been noted before the stools again became positive for the ameba. A permanent negative reaction in individuals positive before treatment is conclusive as to the elimination of the parasite, in our experience. On the contrary, a continued positive complement-fixation test after treatment, even though no amebae are demonstrable in the stools, indicates that further treatment is necessary in order to eliminate the infection.

In conclusion, a word of warning regarding the interpretation of a positive reaction with the complement-fixation test is necessary, for while such a reaction indicates the presence of an infection with *E. histolytica* it does not demonstrate that the clinical condition present is necessarily caused by this parasite, and it should not lead one to neglect the most careful study of the case for other conditions that might produce a similar clinical picture. It should always be remembered that *E. histolytica* is a common parasite of man, occurring in approximately from 8 to 10 per cent of our population, and that because it is so common it will certainly be encountered in many patients suffering from disease conditions simulating in symptomatology infections with this parasite.

Some authorities have apparently blamed the finding of *E. histolytica* in the stools, or a positive reaction with the complement-fixation test, for mistakes in diagnosis of serious nature, in that the clinician neglected to examine his patient for other possible disease conditions, being content to accept the diagnosis of amebiasis as an explanation of the symptomatology present. If such unfortunate diagnostic mistakes have occurred, and they undoubtedly have, it is not the fault of the positive stool examination or the positive complement-fixation reaction that the mistake occurred, but it is the fault of the clinician who failed to recognize the fact that any infection with *E. histolytica* may be combined with other infections or disease processes. If the diagnosis of malignant disease of the intestine is missed because the complement-fixation test for amebiasis is positive or *E. his-*

tolytica is found in the stools, it is not the fault of the test or of the stool examination, but of the attending physician for placing too much faith in laboratory results, and failing to recognize the fact that an amebic infection may be coincident with malignant disease of the intestine and that the symptomatology of both conditions are frequently similar.

REFERENCES

Craig, C. F. The Technique and Results of a Complement Fixation Test for the Diagnosis of Infections with Endamoeba Histolytica. *Am. J. Trop. Med.*, IX:277, 1929.

Craig, C. F. The Diagnostic Value of the Complement Fixation Test in Amebic Infections. *J.A.M.A.*, 95:10, 1930.

Craig, C. F. Complement Fixation in the Diagnosis of Amebiasis. *Ann. Inter. Med.*, V:170, 1931.

Craig, C. F. Further Observations Upon the Complement Fixation Test in the Diagnosis of Amebiasis. *J. Lab. & Clin. Med.*, XVIII:873, 1933.

Craig, C. F. *Amebiasis and Amebic Dysentery.* Thomas, Springfield, Ill., 1935, 231 pp.

Craig, C. F., and Kagy, E. S. A Study of Complement Fixation in Experimental Amebiasis in Dogs. *Am. J. Hyg.*, XVIII:203, 1933.

Heathman, L. Studies on the Antigenic Properties of Some Free-Living and Pathogenic Amebas. *Am. J. Hyg.*, XVI:97, 1932.

Meleney, H., and Frye, W. W. 1935. Unpublished ms.

Menendez, P. E. Serological Relationships of Endamoeba Histolytica. *Am. J. Hyg.*, XV:785, 1932.

Sherwood, N. P., and Heathman, L. Further Studies on the Antigenic Properties of Pathogenic and Free-Living Amebas. II. Complement Fixation in Amebic Dysentery. *Am. J. Hyg.*, XVI:1924, 1932.

Spector, B. K. A Comparative Study of Cultural and Immunological Methods of Diagnosing Infections with Endamoeba Histolytica. *J. Prev. Med.*, VI:117, 1932.

Spector, B. K. Significance of the Small Variety Endamoeba Histolytica. *A.J.P.H.*, XXVI:813, 1936.

Stone, W. S. Bacteria-Free Antigen for the Complement Fixation Test in Amebiasis. *Am. J. Trop. Med.*, XV:685, 1935.

Tsuchiya, H. Further Studies on the Cultivation of Endamoeba Histolytica and a Complement Fixation Test for Amebiasis. *J. Lab. & Clin. Med.*, XIX:495, 1934.

Weiss, W., and Arnold, L. Complement Fixation Test for Amebiasis. *Am. J. Digest. Dis. & Nutrition*, I:231, 1934.

Weiss, W., and Arnold, L. The Specificity of the Complement Fixation Test for Amebiasis. *Am. J. Digest. Dis. & Nutrition*, I:548, 1934.

Standards

"Two of the recommendations adopted by the Inter-Governmental Conference call for special attention, namely, that which advocates that the use of the international standards 'should be made effective by the competent authorities of all countries,' and that which relates to the setting up of national centres to hold and distribute the international standards, since these were the two resolutions that were communicated to all governments by the Secretary-General in February, 1936.

"Replies so far received indicate that 41 countries have adopted or are about to adopt the international standards recommended by the Permanent Commission on Biological Standardisation and that 31 Governments have created or are about to create national centres. . . .

"It would appear that for some drugs — digitalis, pituitary extract, arsphenamine — no insuperable difficulties will be encountered in preparing national standards. This is not the case, however, for the serological standards, and it is to be expected that the Copenhagen Institute will, as in the past, have to supply international standard sera to the great majority of national centres, whose business it will be to preserve these under the requisite conditions of temperature, and distribute them in their own countries to suitable applicants." — Twenty-fifth Session of the Health Committee, League of Nations, May 4, 1937.

Amebiasis in Chicago*

December, 1933, to June, 1936

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IN connection with the study of amebic dysentery in Chicago we have sought to ascertain the varying prevalence of *Endamoeba histolytica* infestations at different periods and in varying groups of the general population. This survey was independent of the examination of groups of persons with known exposure at epidemic foci. Epidemiological information was not collected from each individual examined, but the groups were so selected that but few would be expected to visit the institutions involved in the epidemic. Histories of 34 active cases treated at the Billings Hospital between 1933 and 1936 were studied and only 12 patients stated that they had eaten, lived, or worked at the epidemic foci. Within the limits imposed by the difficulty of obtaining stool specimens, we have endeavored to collect material representative of the general population.

For comparative purposes Table I summarizes the observations concerning the prevalence of *E. histolytica* infestations in America and representative findings in other lands. There is a wide variation in findings (Table I) even by the same workers at close intervals; as in the 3 studies in Tennessee by Meleney and his associates. It is to be noted that in the United States the proportion of observed positive findings of *E. histolytica* ranged from 0.2 per cent to 38 per cent. In foreign countries as high as 72.7 per cent have been found to harbor *E. histolytica*.

METHODS

The best sources from which material for examination could be obtained continuously were the university clinics, the Billings Hospital, and the Lying-In Prenatal Clinic. During the time of this study 5,630 persons were examined from these sources who came from various parts of Chicago and represent persons of modest means. Throughout the study those examined came from the same general population. The clinics which coöperated in sending material included the general medical, gastrointestinal, ophthalmology, otolaryngology, surgery, urology, and dermatology. A closely similar proportion of specimens came from these clinics. A much smaller number came from private and semi-private patients in the general medical wards. The practice was to include the collection of a stool as a part of the general examination. The specimens were usually passed in

* Read before the Laboratory Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 25, 1936.

TABLE I

Results of Surveys of Infestations with E. histolytica

Observer		People Examined	Date	No. of Exams. per Person	No. Examined	Per cent of Positives
A. *American*						
Andrew and Paulson	(1)	Patients at Gastrointestinal Clinic, Baltimore	1931	...	522	0.2
Summerlin	(2)	Private patients, San Diego, Calif.	1934	Children	513	0.4
				Adults	1,339	2.1
Boeck and Stiles	(3)	Am. soldiers with overseas service	1923	1.6	4,536	2.8
" " "		Persons with undetermined status	1923	1.6	362	3.0
Meleney	(4)	Patients in Vanderbilt Hosp., Jan., 1930–June, 1932 (rural and urban from middle Tenn.)	1933	...	2,112	3.0
Boeck and Stiles	(3)	Am. soldiers with service at home	1923	1.6	2,584	3.5
Weinrich, Stabler, and Arnett	(5)	University of Penn. Students	1934	1	1,060	4.1
Giffin	(6)	Various patients at Mayo Clinic	1913	...	1,700	4.5
Naus and Salinger	(7)	Food handlers, New York City	1935	1	222	5.4
Wight	(8)	Ex-soldiers, Veterans Hosp., Calif.	1926	2.4	1,341	6.8
Magath and Ward	(9)	Various patients at Mayo Clinic	1928	...	457	7.9
Boeck and Stiles	(3)	Persons with no military status	1933	1.6	1,547	8.3
Johnston, David, & Reed	(10)	Prisoners, San Quentin Prison, Calif.	1933	...	1,000	9.2
Kofoid, Kornhauser, and Plate	(11)	Am. soldiers who served in France	1919	1	1,200	10.8
Craig	(12)	Medical officers in Washington, D. C.	1932	...	184	13.0
Faust	(13)	People in New Orleans	1931	...	1,100	13.7
Sistrunk	(14)	Various patients at Mayo Clinic	1911	...	145	17.2
Meleney	(15)	Persons in rural Tennessee	1930	...	4,987	17.3
Faust	(16)	Persons in Wise County, Va.	1930	...	460	20.0
Sanford	(17)	Various patients at Mayo Clinic	1916	...	5,000	22.7
Milam and Meleney	(18)	Small rural community in Tenn.	1931	...	374	38.0
B. *Foreign*						
Faust and Wassel	(19)	House servants of Europeans, Wachung, China	1921	...	40	2.5
York, Carter, MacKinnon, Mathews, and Smith	(20)	English persons—never out of England	1917	...	344	2.9
Wenyon and O'Connor	(21)	British West Indian cooks in Alexandria	1917	...	48	4.1
Smith and Matthews	(22)	Cases with history of dysentery, hosp.—Liverpool	1917–1919	2–6	42	7.1
" " "		Non-dysenteric patients in hosp.—Liverpool	1917–1919	...	200	7.5
" " "		Patients with no history of dysentery, hosp.—Liverpool	1917–1919	...	158	7.6
" " "		Patients who had been to tropics and subtropics	1917–1919	...	142	7.7
Gaiskaga	(23)	Adijan—workers and students	1933	...	1,185	9.9
Carter, MacKinnon, Mathews, and Smith	(24)	Dysenteric convalescents, Liverpool	1917	...	910	10.3
Wenyon	(25)	British soldiers from Mediterranean patients in hospital	1916	...	556	10.8
Faust and Wassel	(19)	Coolies—Wachung, China	1921	...	46	10.8
Wenyon and O'Connor	(21)	Native cooks in army bakery, Alexandria	1917	...	87	11.5
McAdam	(26)	Non-dysenteric persons in India	1919	...	351	13.0
Faust	(27)	Patients in North China	1929	...	13,617	15.3
Kessel and Svensson	(28)	Europeans in Peking	1924	...	221	16.5
Epstein	(29)	Armenia	1933	1	?	17.7
McAdam	(26)	Dysentery convalescents—India	1919	...	385	17.8
Gaiskaga	(23)	Adijan—patients with Int. symptoms	1933	...	586	24.9
Epstein	(29)	Persons in Leningrad	1933	1	1,404	25.3
"		Turkestan	1933	1	1,064	25.4
Faust and Wassel	(19)	Europears in Wachung, China	1921	...	98	27.5
Kessel and Svensson	(28)	Chinese in Peking, China	1924	...	816	29.5
Epstein	(29)	Georgia	1933	1	570	32.3
"		Azerbaijan	1933	...	1,146	32.5
Gaiskaga	(23)	Adijan—factory workers	1933	...	463	39.2
Faust and Wassel	(19)	Patients in hosp.—Wachung, China	1921	...	57	50.9
Epstein	(29)	Kola Peninsula (not a case of dysentery)	1933	...	900	60.6
Faust	(13)	People in Panama	1931	...	2,000	72.7

TABLE II

Incidence of Amebiasis—Patients at Billings Hospital and University of Chicago Clinics, 1934 to 1936

			E. Histolytica								
			Large			*Small*			*Large and Small*		
Year	*Month*	*No. of Persons Examined*	*T. ± (P. & C.)*	*P.C.*	*C.*	*T.P.C.*	*P.C.*	*C.*	*T.P.C.*	*P.C.*	*C.*
1934	Jan. to June	737	12	1	5	5	38	198	0	3	6
1934	July to Dec.	892	10	0	5	3	36	100	1	3	9
1935	Jan. to June	1,054	2	1	13	1	5	120	0	1	7
1935	July to Dec.	911	2	1	13	1	5	77	0	1	3
1936	Jan. to June	815	3	0	10	1	3	19	0	0	2

T. = Trophozoites
P. = Precysts
C. = Cysts

the clinic or hospital, but occasionally were collected at home and brought to the laboratory promptly.

From sources outside of the hospital approximately the same number of specimens was obtained, as shown in Table IV. It was not possible to continue obtaining specimens from the same source for prolonged periods. This group includes a disproportionately large number of unemployed and of food handlers.

The fresh specimens were examined by direct smears, using warm water or saline and iodine solution (5 per cent aqueous solution of potassium iodide saturated with iodine and diluted with equal parts of distilled water). As many preparations were made as was necessary but never less than 4; 2 with water or saline and 2 with iodine. Using a No. 10 ocular, the smears were first examined with the low power, then with the high dry. The oil immersion was rarely used. At first cultures were made routinely, but later only when deemed necessary as an additional aid in diagnosis. Most of the persons were examined only once. In case of doubt repeated specimens were examined.

The small and large races of *E. histolytica* were classified morphologically according to the size of the cysts. The small variety were usually 6 to 9 μ in diameter although as small as 5 and as large as 12 μ in diameter were encountered. The large variety ranged from about 13 to 18 μ in diameter. The presence of red blood cells in the trophozoites indicated the presence of the large variety. Earlier studies (31 and 32) have shown that when cultured with ease with the production of a luxuriant growth the organism is usually found to be a large cyst producer. Other differential features disclosed elsewhere were also used in the identification of these races of *E. histolytica*. (31 and 32).

FINDINGS

Prior to mid-December, 1933, the small variety *E. histolytica* cysts (5 μ or less to 12 μ) had not been encountered in Chicago. From that date they began to assume a prominent rôle in the parasitology of the intestinal tract among the local residents. The striking feature in the past 2½ years has been the appearance of these forms and their progressive disappearance. During the first 6 months of 1934 the small variety *E. histolytica* was found in 33.9 per cent of examinations, while through a progressive decrease in only 3.0 per cent in 1936 (see Tables II and III).

TABLE III

Amebiasis at University of Chicago Clinics, Billings Hospital, and Lying-In Prenatal Clinic

University of Chicago Clinics and Billings Hospital

Month and Year	No. of New Persons Exam.	No. +	% +	Large					Small					Large and Small		
				T.P.C.	T.P.	P.C.	T.	C.	T.P.C.	T.P.	P.C.	P.	C.	T.P.C.	P.C.	C.
Dec., 1933	24	5	20.8	1	..	2	..	..	..	*	..	*	2	..	..	..
Jan., 1934	53	19	35.8	..	1	1	1	..	..	..	5	..	10	..	..	1
Feb.	104	40	38.4	..	2	..	1	..	..	..	4	..	32	..	..	1
March	169	49	28.9	..	1	..	1	..	..	1	5	..	41	..	..	..
April	100	41	40.0	..	..	..	..	3	2	1	5	1	26	..	1	2
May	124	53	42.7	1	2	..	..	1	..	..	8	2	37	..	..	2
June	187	66	35.4	..	..	..	2	1	1	..	8	..	52	..	2	..
July	160	47	29.3	..	2	..	..	1	1	..	15	..	25	..	..	3
Aug.	147	35	23.8	1	1	..	..	..	..	..	7	1	24	..	1	..
Sept.	189	19	10.0	1	..	..	1	1	..	..	2	..	12	1	..	1
Oct.	156	23	14.7	..	..	..	..	1	..	..	2	..	17	..	1	2
Nov.	126	25	19.8	1	1	..	1	..	2	..	6	..	12	..	1	1
Dec.	114	18	15.7	..	1	..	..	2	..	..	2	1	10	..	..	2
Jan., 1935	166	31	18.6	..	..	..	..	2	..	..	2	..	25	..	1	1
Feb.	153	32	20.9	..	..	..	..	2	..	..	1	..	27	..	..	2
March	215	27	13.0	1	..	..	..	3	1	..	1	..	20	..	..	2
April	163	21	12.8	..	..	1	..	3	..	..	1	..	16	..	..	..
May	183	21	11.4	..	..	..	..	2	..	..	..	..	18	..	..	1
June	174	17	9.7	..	1	..	..	1	..	..	..	..	14	..	..	1
July	163	25	15.3	..	1	1	..	3	1	..	1	1	16	..	1	..
Aug.	84	15	17.8	..	1	..	..	1	..	..	1	..	11	..	..	1
Sept.	152	16	10.5	..	..	..	..	1	..	..	1	..	13	..	..	1
Oct.	180	20	11.1	..	..	..	..	4	..	..	1	..	14	..	..	1
Nov.	181	19	10.4	..	..	..	..	3	..	..	..	..	16	..	..	..
Dec.	151	8	5.2	..	..	..	..	1	..	..	..	..	7	..	..	..
Jan., 1936	136	5	3.6	..	..	..	..	1	..	..	1	..	2	..	..	1
Feb.	123	3	2.4	..	..	..	..	..	..	..	2	..	1	..	..	..
March	135	7	5.1	..	..	..	..	2	..	..	..	..	5	..	..	..
April	129	8	6.2	..	..	..	..	1	..	..	..	..	7	..	..	..
May	135	6	4.4	2	..	..	..	1	1	..	..	..	2	..	..	..
June	157	9	5.7	1	..	..	..	5	..	..	..	..	2	..	..	1
Total	4,433	730														

Lying-In Prenatal Clinic

Month and Year	No. of New Persons Exam.	No. +	% +	Large			Small		Large and Small Cysts
				T.P.	P.C.	C.	P.C.	C.	
Jan., 1935	..	..	....	..	..	..	..	..	..
Feb.	4	..	....	..	..	..	..	..	..
March	65	7	10.7	..	..	1	..	5	1
April	45	7	15.5	..	..	2	..	5	..
May	48	6	12.5	..	..	..	..	6	..
June	39	6	15.3	..	..	..	..	5	1
July	37	2	5.4	1	..	..	..	1	..
Aug.	52	9	17.3	..	1	..	2	6	..
Sept.	73	8	10.9	..	..	1	1	5	1
Oct.	122	16	13.1	..	..	1	..	10	5
Nov.	104	6	5.7	..	..	1	..	5	..
Dec.	43	4	9.3	..	..	..	..	3	1
Jan., 1936	108	12	11.1	..	..	2	..	10	..
Feb.	90	7	7.7	..	..	2	..	5	..
March	140	15	10.7	..	..	4	..	9	2
April	81	1	1.2	..	..	..	..	1	..
May	85	8	9.4	..	..	4	..	3	1
June	61	4	6.5	..	..	1	..	3	..
Total	1,197	118							

T. = Trophozoites
P. = Precysts
C. = Cysts

L. = Large variety
S. = Small variety

* Only 1 specimen was obtained before treatment. Clinically and culturally they fall here rather than with the large variety.

TABLE IV

Amebiasis in Chicago, 1934–1936

Date of Exam.								*E. histolytica*						
								Large			Small		Large and Small	
Year	Month	Persons Examined	Adults	Children	No. Examined	No. +	% +	T.	P.C.	C.	P.C.	C.	P.C.	C.
1934	Mar. and Apr.	Employees at hospital X	X	..	88	10	11.3	..	..	1	..	8	1	..
1934	June and July	Kitchen help—Cook County Hosp.	X	..	93	8	8.3	..	..	2	1	5	..	..
1934	Feb. to Aug.	Food handlers (mainly unemployed waiters)	X	..	572	104	18.1	5	34	41	3	18	1	2
1934–35	Apr., 1934, to July, 1935	Food handlers, new applicants (S. Sh. C. C.)	X	..	248	44	17.7	1	..	1	8	31	..	3
1934	July	Firemen (who were not at stock yards fire)	X	..	167	30	17.96	..	..	3	3	22	2	..
1935	Mar. to July	University of Chicago medical students	X	..	78	8	10.2	..	..	.	..	6	..	2
1935	Apr.	Men from the Water Purification Division	X	..	39	8	20.5	..	..	3	..	5	..	..
1936	Oct.	Men from the Water Purification Division	X	..	58	3	5.1	..	..	1	..	2	..	..
1935–36	Feb., 1935, to June, 1936	Health Service, U. of Chicago Clinics	X	..	112	10	8.9	..	..	3	..	7	..	..
1935	Jan. to Oct.	Down-town dept. store (largely food handlers)	X	..	572	64	11.19	..	..	15	..	45	..	4
1935–36	Nov., 1935, to Mar., 1936	Factory along Chicago River	X	..	129	12	9.3	..	..	4	..	7	..	1
1934–35	Sept., 1934, to Jan., 1935	Transient shelters (317 S. Throop St., etc.)	X	..	546	121	22.1	..	..	21	1	94	..	5
1934	Nov.	Transient shelter (4949 Indiana Ave.) (mostly colored)	X	..	240	51	21.2	..	..	7	..	38	..	6
1934	Oct.	Cathedral shelter (older men)	X	..	56	11	19.6	..	..	3	..	8	..	..
1934	Nov.	Transient shelter for older men (563 W. Randolph St.)	X	..	30	2	6.6	..	..	1	..	1	..	..
1934–35	Dec., 1934, to Jan., 1935	Service Bureau for Men (1808 W. Harrison St.)	X	..	279	63	22.5	..	..	7	3	45	..	8
1936	Apr. to June	Shelters at 1808 W. Harrison St. and 1426 S. Newberry Ave.	X	..	151	6	3.97	..	..	3	..	3	..	..
					3,458	555	.....	6	34	116	19	345	4	31
1936	Apr. to June	Country Home for Convalescent Children	..	X	157	8	5.5	..	..	4	..	4	..	..
1934	May to Sept.	Cook County Hospital—Children	.	X	514	25	4.8	..	1	3	..	19	..	2
1934	Dec.	Children's Memorial Hospital and Home for Crippled Children	..	X	204	9	4.4	..	..	1	..	7	..	1
1936	Feb.	Home for Jewish Orphans (mainly children, few adults)	X	X	145	4	2.7	..	..	2*	..	2†	..	..
		Mainly children			1,020	46	...	..	1	10	..	32	..	3
		Adults			3,458	555	...	6	34	116	19	345	4	31
		Total			4,478	601	...	6	35	126	19	377	4	34

* Both adult employees
† 10 and 16 years of age

T. = Trophozoites
P. = Precysts
C. = Cysts

There has also been a marked variation in the frequency with which the trophozoites and precysts have been encountered. In 1934, for both large and small varieties, these were frequent. In 1935 and 1936 they were relatively infrequent. The incidence of these forms decreased more rapidly than did the incidence of the cyst carriers. The proportion found to harbor the large variety *E. histolytica* cysts has shown no significant change.

When the small variety *E. histolytica* cysts first made their appearance they were typical in morphology (round or oval), varying from about 5 to 12 μ in diameter. They were widely distributed and were usually numerous in positive stools. As their incidence diminished, the number per positive stool diminished and pleomorphic forms appeared until now it is almost impossible to find a good heavily infected specimen.

Data presented in Table IV seem to substantiate the series of observations on patients from the University of Chicago Clinics and Billings Hospital. The greater constancy of proportion of the large cyst carriers as compared with the small cyst carriers is evident.

DISCUSSION

The observations here presented give further evidence of the distinctive features of these varities of *E. histolytica*. In the general population from 1 to 3 per cent have been found to harbor the large variety *E. histolytica*. The relative constancy of the proportion of these carriers suggests that either those who harbor the large cysts tend to be chronic carriers or that new infestations equal in number the spontaneous cessation of the carrier state.

It appears that for some undetermined cause there was a widespread infestation with *E. histolytica* of the small cyst variety which began the latter part of December, 1933. During 1934 the general population was heavily infested, and few of them received medication. The carrier state seems to have discontinued spontaneously. Whether the residents of Chicago will gradually again become free of infestation with the small variety of *E. histolytica* is a matter to be determined by further observations.

CONCLUSIONS

1. There was an epidemic of the small variety *E. histolytica* in Chicago beginning the latter part of December, 1933, reaching a climax in the spring and summer of 1934, and which declined to almost extinction by the summer of 1936.

2. When they first appeared the small variety were numerous and typical morphologically; later they diminished in number and pleomorphic forms appeared, and finally became exceedingly scarce.

3. The large variety, on the other hand, remained typical morphologically and did not undergo such a decrease in incidence.

4. There does not seem to be any direct relation between the number of carriers and the incidence of acute amebic dysentery. This is based on results in Table II, column marked "Large," and Table III, results at University of Chicago and Billings Hospital.

BIBLIOGRAPHY

1. Andrew, J. and Paulson, M. Incidence of Intestinal Protozoa with Special Reference to *E. histolytica* in Persons of Temperate Zones. *Am. J. Med. Sci.*, 181:102–106, 1931.

2. Summerlin, H. S. Amebiasis in Private Practice. San Diego, Cal. *J.A.M.A.*, 102:363–364, 1934.

3. Boeck, W. C. and Stiles, C. W. Studies on Various Intestinal Parasites of Man. *Bull.* 133, *Hyg. Lab.*, U. S. Public Health Service, 1923.

4. Meleney, H. E. The Relative Incidence of Intestinal Parasites in Hospital Patients in Nashville and in Rural Tenn. *J. Lab. & Clin. Med.*, 19:113–119, 1933.

5. Weinrich, D. H., Stabler, R. M. and Arnett, J. H. *E. histolytica* and Other Intestinal Protozoa in 1060 College Freshmen. *Am. J. Trop. Med.*, 15: 331–345, 1935.

6. Giffin, H. Z. Clinical Notes on Patients from the Middle Northwest Infected with *E. histolytica*. *J.A.M.A.*, 61:675–678, 1913.

7. Naus, R. W. and Salinger, M. H. Amebic and Other Intestinal Protozoal Infestations in Representative Groups of New York City. *A.J.P.H.*, 25:819–828, 1935.

8. Wight, T. Quoted by 30 (*U. S. Veterans Bureau Med. Bull.*, 22:557, 1926).

9. Magath, T. B., and Ward, Charlotte B. Laboratory Methods of Diagnosing Amebiasis. *Am. J. Hyg.*, 8:840–855, 1928.

10. Johnston, A. N., David, N. A., and Reed,

A. C. Protozoal Survey of 1000 Prisoners. *J.A.M.A.*, 100:728–731, 1933.

11. Kofoid, Charles A., Kornhauser, S. I., and Plate, J. T. Intestinal Parasites in Overseas and Home Service Troops of the U. S. Army. *J.A.M.A.*, 72:1721–1724, 1919.

12. Craig, Charles F. The Amebiasis Problem. *J.A.M.A.*, 98:1615–1620, 1932.

13. Faust, E. C. Incidence and Significance of Infestation with *E. histolytica* in New Orleans and American Tropics. *Am. J. Trop. Med.*, 11:231–237, 1931.

14. Sistrunk, W. E. Intestinal Parasites Found in Individuals Residing in Northwest. *J.A.M.A.*, 57:1507–1509, 1911.

15. Meleney, H. E. Community Survey for *E. histolytica* and Other Intestinal Protozoa in Tennessee. *J. Parasitol*, 16:146–153, 1930.

16. Faust, E. C. A Study of the Intestinal Protozoa of a Representative Sampling of the Population of Wise County, Va. *Am. J. Hyg.*, 11:371–384, 1930.

17. Sanford, A. H. The Geographic Distribution of Amebiasis. *J.A.M.A.*, 67:1923–1926, 1916.

18. Milam, D. F., and Meleney, H. E. Investigations of *E. histolytica* and Other Intestinal Protozoa in Tennessee, etc. *Am. J. Hyg.*, 14:325–336, 1931.

19. Faust, E. C. and Wassel. Quoted by 30.

20. Yorke, W., Carter, H. F., MacKinnon, D. L., Mathews, J. R., and Smith, A. M. Persons who have never been out of Great Britain as Carriers of *E. histolytica*. *Ann. Trop. Med.*, 11–12:87–90, 1917–1919.

21. Wenyon, C. M. and O'Connor, F. W. Human Intestinal Protozoa in the Near East, 1917.

22. Smith, A. M. and Mathews, J. R. Further Record of the Occurrence of Intestinal Protozoa in Non-dysenteric Cases. *Ann. Trop. Med.*, 11–12: 183–193, 1917–1919.

23. Gaiskaga, E. L. Distribution of Amebiasis in Adijan. *Trop. Dis. Bull.*, 279, 1934.

24. Carter, H. F., MacKinnon, D. L., Mathews, J. R. and Smith, A. M. The Protozoal Findings in 910 Cases of Dysentery, etc. *Ann. Trop. Med.*, 10:411–426, 1916–1917.

25. Wenyon, C. M. Quoted by 21.

26. McAdam, W. Quoted by 30.

27. Faust, E. C. Human Intestinal Parasites in North China. *Am. J. Hyg.*, 9:505–508, 1929.

28. Kessell, J. F. and Svensson. Quoted by 30.

29. Epstein, G. W. Materials on the Epidemiology of Amebiasis. *Trop. Dis. Bull.*, 278, 1934.

30. Craig, Charles F. Amebiasis and Amebic Dysentery, 1934.

31. Spector, B. K. Tentative Methods for the Diagnosis of Amebiasis and Amebic Dysentery. *A.P.H.A. Year Book*, 130–143, 1935–1936.

32. Spector, B. K. Significance of the Small Variety *Endamoeba histolytica*. *A.J.P.H.*, 26:813–818, 1936.

Infant Mortality in New York City*

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ALONG with other cities in the United States and abroad, New York City was experiencing a declining infant death rate as a by-product of the increase of medical knowledge and the general improvement in sanitary conditions long before a specific program to combat infant mortality was inaugurated in the city. Bolduan and Weiner [1] have shown that the infant death rate in New York City has been declining since 1870.

In the past 20 years, despite yearly fluctuations, there has been a continued downward trend in the infant mortality rate for New York City, the rates declining from 93 per 1,000 live births in 1916 to 48 in 1935. The decline is most readily appreciated from the curve in Figure I.

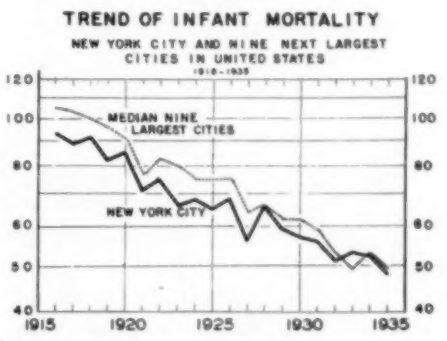
For purposes of comparison, a curve of the medians of the infant mortality rates of the other 9 largest cities in the United States is also shown. In terms of the 20 year mean, the infant mortality rate for the city as a whole declined at a rate of 3.4 per cent per annum over this period. Unfortunately, the detailed data for the other 9 cities were not available for the entire 20 years covered by this review, and the mathematical value of the trend cannot be calculated. It appears, however, that the rate of decline in this group of cities has been greater than in New York, especially in recent years, and the question might well be raised whether New York City is not approaching a plateau in the infant mortality rate which will require newly directed efforts in the child hygiene program.

DECLINE IN INFANT MORTALITY BY CAUSES

The general trend of the infant mortality from certain selected groups of causes is shown in Figure II (also see table).

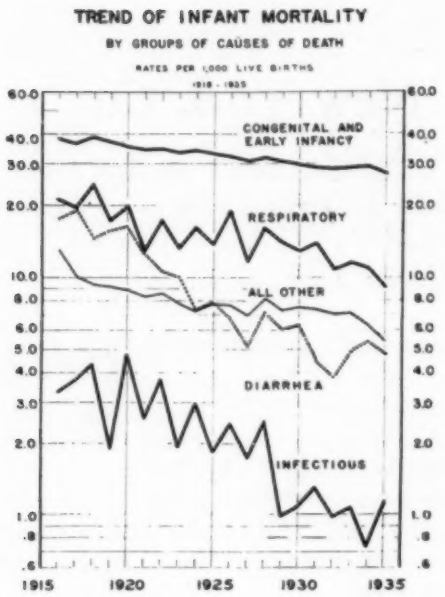
This chart shows clearly that the greatest progress has been made in precisely those fields where our knowledge has been greatest. Diarrheal deaths have declined at the average annual rate of 8.3 per cent of their 20 year mean, while the mortality from preventable diseases — largely measles,

FIGURE I



* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 21, 1936.

FIGURE II



scarlet fever, and whooping cough—has gone down at the rate of 7.6 per cent per annum. The decline in the infant death rate from respiratory diseases, 3.7 per cent per annum, was only slightly greater than that of the total infant mortality rate, while that for the group of conditions classed as Diseases of Early Infancy—prematurity, congenital malformations and injuries at birth—has lagged far behind the decline of the total rate, having decreased at the rate of only 1.8 per cent per annum. Infant mortality from other causes—syphilis, simple meningitis, diseases of the ear, hernia, and accidents—declined at the rate of 2.9 per cent per annum, also lagging behind the decline in the total rate.

AGE AS A FACTOR

From the facts presented in Figure II, it is logical to conclude that the great reduction in the infant death rate has been largely restricted to infants who have survived the first weeks, and relatively little has been done to improve the lot of the infant at birth. The accuracy of this conclusion is brought out in Figure III, which shows that while the death rate in the age group, 1 month to 12 months, inclusive, declined 68 per cent (from 63.8 in 1916 to 20.7 in 1935), the mortality of infants in the first month of life declined only 21 per cent (from 36.8 to 29.1). The total death rate under 1 year declined approximately 50 per cent during the same time. It is the reduction of the neonatal mortality that constitutes the challenge for the future.

TABLE I

City of New York
Reduction in Infant Mortality By Groups of Causes*
1916 to 1935

Cause	Average Death Rate *	Annual Average Change	Annual Change Per cent of Mean
All Causes	67.5	—2.30	—3.4
Diarrhea and Enteritis	9.3	—0.77	—8.3
Communicable Diseases	2.2	—0.17	—7.6
Respiratory Diseases	15.3	—0.56	—3.7
Congenital Causes	32.6	—0.57	—1.8
Other Causes	8.1	—0.23	—2.9

* Deaths under 1 year of age per 1,000 live births

Statistical Division
Bureau of Records

Department of Health
City of New York

THE RACIAL FACTOR

The infant mortality rate of negroes in New York City is nearly double that

FIGURE III

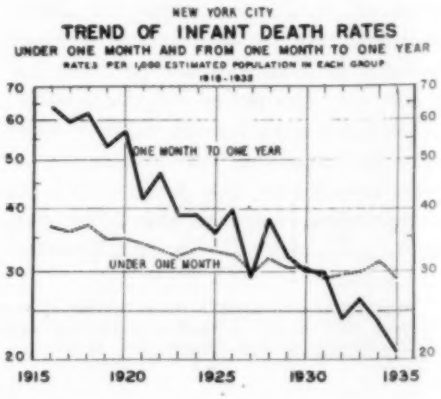
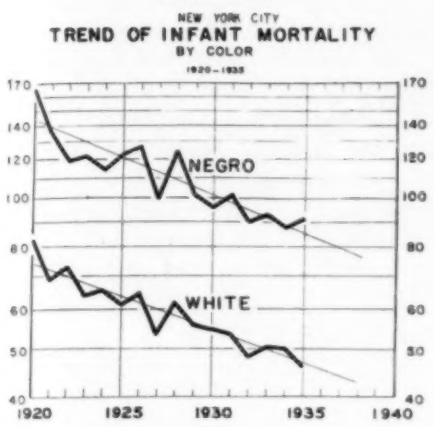


FIGURE IV



of the whites (Figure IV). The negro population has increased materially in the last 10 years, though the proportion is still relatively so small as to increase the general city rate only 2 or 3 points. The decline in the rate among negroes during the 16 years, 1920 to 1935, has equalled the decline in the white rate. The negro rate declined 3.4 per annum; the white 3.3 per cent.

PROBABLE CHIEF CAUSES FOR THE REDUCTION

Many factors have contributed to the decline in infant mortality. In most large cities there has been established a system of stations for the care of well babies under both official and voluntary auspices. The regular health supervision of the infant and the education of the mother in the care and feeding of the baby has had a large effect. The safeguarding of milk supplies and the control of communicable diseases, together with the general health education of the public have played their part in saving infant lives. New York City has enjoyed benefits from all of these measures. In addition, special mention may be made of two favorable factors of more recent date:

1. The character of the population is tending toward stabilization. The United States Immigration Quota Laws of 1922 and 1929 have rigidly controlled the number of aliens entering the country, and have set up individual requirements of literacy, intelligence, and health. The effect has been to reduce the numbers of certain groups with high infant mortality rates and presumably improve the caliber, from a health standpoint, of those that have come.

2. There has been during the depression an increased supervision of the health of the low-income group. Heretofore, if a man earned $16 per week, the spending of it was largely his own affair. Now a large proportion of the clientele of the department's Baby Health Stations is "on relief." The relief agencies in New York City have given splendid coöperation in matters pertaining to the public health, and have been eager to secure accurate information to help them in guiding their clients. They have requested frequent meetings for instruction of their personnel in matters of infant health, tuberculosis, venereal disease prevention and treatment, and other public health problems. They have urged health supervision for their clients and have referred them to suitable facilities. Probably never before has there been such widespread supervision of the health of low-income groups.

INFANT HYGIENE PROGRAM OF THE IMMEDIATE FUTURE

In the face of the facts outlined above, what are the most promising lines of attack in the immediate future? The usual child hygiene program is not so constituted as to affect to any marked degree the neonatal causes of death. New York City has already undertaken several steps designed to meet the situation more appropriately.

The Development of Health Districts—The plan of organizing the city into 30 health districts, each in charge of a health officer, was put into effect in 1934. The object was to bring health work closer to the people and to make possible a more intimate understanding of the specific needs of each district. Seven districts were organized in 1934, and 8 more will be organized early in 1937. By a temporary combination of the remaining districts it is planned to have the entire city administered under the decentralized plan before the end of 1937. Under this arrangement the child hygiene program will be expanded and conducted more intensively. In the districts first organized the response of mothers has been reflected in the increased registration at the baby health conferences. Registration of infants under 1 month of age increased from 64 per 1,000 live births in 1931 to 99 in 1935.

The Advisory Obstetrical Council—Although the Health Department is directly responsible through its own prenatal clinics for only a small proportion of the prenatal cases throughout the city—about 5 per cent—and does not participate in any delivery program, it must, nevertheless, recognize its responsibility of leadership to this important work. To this end the Commissioner appointed, in 1934, an Advisory Obstetrical Council of 18 leading obstetricians to study this problem thoroughly and present concrete suggestions and recommendations for correcting the situation. For many years, indigent and low income patients have been urged to register with a hospital and go there for confinement. That this education has been effective is shown by the fact that during the past 5 years an average of 78 per cent of all births in New York City have occurred in hospitals. If this program is to be successful, adequate hospital facilities must be easily available.

The Advisory Obstetrical Council believes that there must be a much closer relationship between the prenatal clinics and the hospital obstetrical services. One recommendation is that every physician in a prenatal clinic must have affiliation with the obstetrical staff of a recognized hospital. As new staff appointments are made, this recommendation is being followed.

The question of relationship between the prenatal care of the women in the indigent and low income groups and the delivery service for these women is complex and is being further studied. A moot question is whether prenatal clinics should be invariably attached to obstetrical services of hospitals. This would undoubtedly raise the standard of work and facilitate care of emergencies. A practical difficulty is that hospitals are frequently not so located geographically as to be easily accessible for prenatal clinics, and hospitals, as a rule, do not conduct outside substations. The exchange of records between the prenatal clinic and the hospital has been advocated and tried to some extent. Because experience shows that women often go to different hospitals from the ones where they registered, the suggestion has been made that the prenatal clinic give to the woman herself a record form containing all data that might be helpful to the hospital and rely upon her to present this record to the hospital upon admission. This plan has been held in abeyance pending the final report and recommendations of the Advisory Obstetrical Council.

Increased Emphasis on the Diagnosis and Treatment of Syphilis in Pregnancy—As one of the measures aimed at reducing neonatal deaths, renewed emphasis has been placed on the early diagnosis and treatment of syphilis in

the pregnant woman. Wassermann tests are taken on all women attending departmental prenatal clinics, and facilities are now available for prompt and continued treatment of every woman found with syphilis. At the instigation of the Health Department, other prenatal clinics where formerly a test was made only " when indicated," have now made it routine. Arsenicals are now distributed free by the Health Department to any physician in the city for cases of infectious syphilis, congenital syphilis, and syphilis in pregnant women. Voluntary hospitals treating free cases may also obtain free drugs for these types of cases. Departmental staff and allied health workers, including practising physicians and midwives, have had the necessity for the early diagnosis and treatment of syphilis in pregnant women forcibly and repeatedly brought to their attention through varied methods of health education.

Facilities for the Care of Premature Infants—In 1935, out of a total of nearly 4,800 deaths under 1 year of age, approximately 1,500, or about 30 per cent, were due to premature births. This offers a direct challenge to all workers in the field of maternal and infant hygiene.

The education of all women to secure early, adequate, and continuous prenatal care is being stressed. The expectant mother is given definite information about the possibility of premature birth and what to do if it occurs. Every pregnant woman and a responsible member of her household should be taught that a premature baby needs special care, and where and how the necessary facilities may be quickly obtained. Practising physicians should also be notified of all facilities for premature infants and how to obtain their use. A recent survey shows that 84 hospitals have a total of over 200 incubators, warm beds, and bassinets, and 5 special rooms for the care of premature infants. Estimates place the use of these facilities at only from 50 to 75 per cent of their capacity. This is probably due to lack of information of the public and of the medical profession as to their existence and availability, rather than to the lack of need for them. Bundesen's [2] program for the care of premature infants initiated in Chicago in 1935 has shown that excellent results may be obtained through such leadership by the official health agency.

In addition to keeping the premature baby warm enough from the time of birth, preventing infections, and providing medical and nursing care especially adapted to this condition, the supplying of proper food is essential. New York City is fortunate in the provision for obtaining breast milk through the Mothers' Milk Bureau operated by the Children's Welfare Federation. Milk is collected from healthy mothers nursing their own healthy babies and, after pasteurization, is dispensed on doctors' prescriptions for premature and very ill infants. A new process makes it possible to preserve this milk by freezing, so that an adequate supply may be constantly available. Such a supply of breast milk is an important factor in any program for premature infants.

The care of premature infants constitutes a distinct specialty within the specialty of pediatrics. More knowledge concerning the fundamental policies underlying the requisite medical care based on the differences in anatomy and physiology and health needs of an infant born prematurely, and a wider dissemination of such knowledge, is needed.

SUMMARY AND CONCLUSION

The favorable change in infant mor-

tality has occurred chiefly in the age group 1 month to 1 year, and there has been comparatively little change in the neonatal mortality rate. The reason for this difference would seem to be that the child hygiene program is not adapted to affect the chief causes of neonatal deaths. There is need for a more adequate prenatal program closely allied to an obstetrical program.

Health education, the control of syphilis, the care of premature infants, intensified maternal and infant work suited to the needs of local areas, and adequate, easily available obstetrical facilities are all points of attack on this problem.

While the infant mortality rate as a whole is decreasing and is apparently favorably affected by the maternal and child health program, the real challenge in New York City lies in the field of neonatal mortality.

REFERENCES

1. Bolduan, Charles, and Weiner, Louis. Infant Mortality in New York City One Hundred Years Ago. *J. Pediat.*, 7:1 (July), 1935.

2. Bundesen, Herman N., Dohms, O. A., Fishbein, W. I., and Harmon, G. E. Mortality of Newborn Infants in Chicago During 1935. *J.A.M.A.*, 107:270–276 (July 25), 1936.

Preliminary Report of the Sub-Committee on the Educational Qualifications of Public Health Statisticians*

IN its study of efforts to formulate an educational program of professional study for young men and women who anticipate public health statistics as careers, your Sub-Committee on the Professional Education of Public Health Statisticians prepared a questionnaire concerning this matter and submitted it to a number of recognized public health statisticians in our country for criticism, comment, and suggestions. An analysis of the received questionnaires shows a wide range of opinions. The extent of education and training that should be prescribed according to these returns runs from—"college course not necessary, however not detrimental" to "Master's degree and Doctor's degree."

The American Public Health Association's Committee on Professional Education, in its deliberations on professional education and training for other fields of public health so far considered by it, leans toward the principle that education and preparation for given fields of service should be on as high a level as is consistent with indicated needs, and that it should formulate and recommend comprehensive professional education programs of study toward the achievement of which we should *strive*, rather than stipulate training curricula based on the educational qualifications of the average incumbent in public health today.

The Sub-committee on Professional Education for Public Health Statisticians, recognizing that principle, presents and recommends in this report a professional education curriculum to work *toward* rather than an educational requirement to be demanded at once of all public health statisticians. In view of the returned questionnaires, we realize that many public health statisticians now in the field will regard the qualifications recommended as being too high. Others will feel they are inadequate.

To the former we may call attention to the fact that a number of universities are ready to provide programs of study in public health statistics according to the recommendations in this report. To the latter we suggest acceptance of this level as the first step. The future, doubtless, will bring modifications and further changes.

Your sub-committee wishes to emphasize at this point that it is not the intention that those now in the field of public health statistics rendering satisfactory and praiseworthy service but

* The Committee on Professional Education of the American Public Health Association publishes this Report of the Sub-Committee to permit the members and Fellows of the American Public Health Association to review it and to offer criticisms and suggestions to the Committee in the further consideration of the report.

who do not meet the educational qualifications recommended in the following report shall be supplanted by those who meet them. The committee recommends that the following program of study be accepted as a guide for study and preparation for young men and women who anticipate careers as public health statisticians.

RECOMMENDATIONS

The Sub-committee on the Professional Education for Public Health Statisticians, recommends that at least 1 year of prescribed graduate professional education, leading to the Master's degree or certificate, subsequent to graduation from college, and at least 3 months of directed practical public health statistical experience in a recognized public health or related agency, be approved and declared as the educational qualifications and training for public health statisticians, toward which we should plan, for the future.

I. *College Education*—A broad cultural education which can be obtained in a recognized college of arts, science, and literature is highly desirable. The subjects which should be elected in the college and regarded as prerequisites, more or less, to public health statistics fall into 4 groups. These are as follows:

1. Mathematics: Algebra, Geometry—Plane and analytic, Trigonometry, Calculus, Elementary mathematical analyses and statistics
2. Physical Sciences: Chemistry and Physics
3. Biology: General Biology or Zoölogy, including Vertebrate Anatomy, Physiology, and Bacteriology
4. Social Sciences: Sociology, Economics, and Government

These 4 groups of courses may be regarded as basic preparation for the profession of public health statisticians. However, they should not be too intensively and extensively pursued, so that other subjects of cultural value are omitted. Among these other subjects, one cannot emphasize too much the importance of English, including diction and composition. The presentation and interpretation of health statistics to the public in an interesting and impelling manner is one of the important needs of our time. History, philosophy, logic, anthropology, German, and French are other subjects which have been accentuated by public health statisticians.

It is apparent that it would be difficult, probably impossible, for the future public health statistician to complete all the courses recommended and stressed during his undergraduate education.

II. *Professional Graduate Studies*—In addition to the undergraduate work outlined, at least 1 year of professional graduate work, leading to the Master's degree or certificate in public health, in a university adequately equipped to offer this instruction, is recommended as the professional educational qualifications toward which we should strive. The following program of study is suggested although this may be modified, of course depending on the previous college education:

1. *Statistics*—It is obvious that the study of general and public health statistics is fundamental. It should be pursued throughout the academic year. A course in the theory and application of general statistics should be followed by one in public health statistics
   a. Theory and Application of Statistics—The contents of this course should include: theory of measurements and their precision; methods of classification, generalization, comparison, display of facts, and conclusions; methods of standardization and correction of rates; mathematical grouping and graphic presentation; study of tabulation—statistical machine methods; errors in raw material—statistical; elements of statistical surveys and studies; theory of proba-

bility—permutations and combinations; simple, partial, and multiple correlations; elementary time series; curve fitting; interpolations and predictions; probable and standard errors and their uses; averages; sampling; regression lines; growth curves; measurement of variation; measures of central tendency.

b. Public Health Statistics—History, nature, and purpose of vital statistics; population, including methods of population estimates; life tables; methods of collection and tabulation; general and specific rates, including birth rates, death rates, infant mortality, etc.; standardization of rates; registration areas; analyses of mortality and morbidity rates; probability; the effect of such factors as age, sex, race, etc.; federal, state, municipal, and county vital statistics; elements of statistical surveys; critical survey of appraisal forms.

It is obvious that courses in statistics will vary and that the items stipulated in each course will not be followed in the order designated. Moreover, it is apparent that in some courses offered, public health statistics will be built more closely into general statistics in such a manner that the items in the one will be included in the other, and *vice versa*. The items included in these courses have been suggested by recognized public health statisticians.

Each course should be supplemented with adequate laboratory work, including the operation of computing, punching, sorting, and tabulating machines.

2. *Personal Hygiene*—Eugenics and euthenics; Due consideration should be given to the following factors: air and ventilation; nutrition; mental hygiene; poisons; mechanical injuries; illumination; exercise; rest; fatigue; morbid processes and defects which are prone to develop during the various age periods of life, including cancer and the degenerative group of diseases; hygiene of special senses and systems, accompanied by review of anatomy and physiology of organs and systems considered; periodic health examinations; prevention, correction, or control of defects; social significance of disease.

3. *Communicable Diseases and Epidemiology*—The nature, source, classification, routes of transmission, and the general and specific procedures for preventing and controlling communicable diseases. Rules and regulations for control, including isolation and quarantine. General procedures: water purification, sewage treatment, refuse disposal, milk control, food inspection and control, eradication of insects. Specific measures: biologics, immunization. Other diseases and disorders of community interest. General epidemiological procedures. Geography of disease. Seasonal variations.

4. *Nosology*—Nomenclature and classification of diseases; standard classified nomenclature of diseases; international list of causes of death; ill-defined diseases and undesirable terms; combined causes. It is recommended that this course be presented in so far as it is feasible with pathological and clinical demonstrations.

5. *Graphic Methods*—Principles of elementary graphic presentation, functions of charts; preliminary procedures in making charts; classification of charts on various bases; details of form-dimensions, types of scales, position of scales; method of differentiating several parts; purpose for which used; circumstances under which used; types of comparison to be made; methods of reproduction; points to be considered in making chart or graph; types of charts and graphs; types of paper used for graphical work; instruments.

6. *Public Health Law and Administration*—Public health laws and regulations, police power, enforcement of public health laws, advisory powers of board of health, public health authorities, organization and administration of governmental health agencies—federal, state, municipal, and county, including services; nursing, hospital, health education, sanitation, maternity, and infant, preschool and school, industrial, statistics, communicable diseases and epidemiology, public health laboratories.

7. *Laboratory Health-Medical Sciences*—In view of the fact that the human body, normal and abnormal, is the center of interest in public health statistics, it is obvious that the public health statistician should possess a "working knowledge" of the normal structure and functions of the human body and with the morbid processes which effect it. It is, therefore, recommended that the professional educational and training program of study for public health statisticians include, in addition to

bacteriology, which is prescribed as an admission requirement, substantial courses in anatomy, physiology and pathology. These courses in the health-medical laboratory sciences need not be so intensive and extensive as those prescribed for medical students. They can be modified with a view of meeting the needs of public health statisticians and for the other public health services for which a thorough training in medicine is not essential.

III. *Suggested Schedule*—Those concerned with the professional education for the several fields of public health may be interested in the following schedule which is suggested for universities on the semester plan. It can be modified readily for the trimester or quarter systems.

First Semester

Courses

General Statistics
Personal Hygiene
Drawing—Graphic Methods
Anatomy
Physiology

Second Semester

Courses

Public Health Statistics
Communicable Diseases and Epidemiology
Public Health Law and Administration
Nosology
Pathology

IV. *Practical Field Work*—Satisfactory completion of a program of study as recommended above should be followed by at least 3 months of supervised practical work in a recognized bureau of public health statistics in a governmental health department. The degree of Master of Science in Public Health or Public Health Statistics or Certificate in Public Health Statistics should be conferred on the student who has completed both the program of study in the university and the field work.

V. *The Doctor's Degree in Public Health Statistics*—Both the program of study and the field work outlined and recommended in this report have been concerned wholly with the general professional educational qualifications which should be designated by the Committee on Professional Education of the American Public Health Association, for public health statisticians in the future. The committee, however, should call attention to the opportunities and needs for more extensive and intensive education and training in this field and related fields. In a measure, this is a statistical age. Men and women of the highest educational qualifications will be needed for teaching, research purposes, and for the direction of statistical surveys, and so on. Some suggest that the public health statistician should be a graduate of medicine or possess a Doctor's degree in Public Health.

In any event, universities equipped to do so should offer opportunities for advanced education and research in public health statistics and the related fields including biometry and medical, social, and economic statistics, leading to the Doctor's degree—Ph.D., D.Sc.

JOHN SUNDWALL, *Chairman*
G. E. HARMON
A. W. HEDRICH
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H. L. DUNN

Preliminary Report of the Sub-Committee on the Educational Qualifications of School Health Educators*

FROM its inception, the Committee on Professional Education of the American Public Health Association has been mindful of the significance of the modern public school health education movement and the obligations of the committee in helping the public schools to initiate and carry on comprehensive and constructive health programs. The proverb: "Train up a child in the way he should go and when he is old, he will not depart from it," possesses a most important implication in respect to public health work in general and public school health work in particular.

In the modern public school movement, attempts are being made on the part of several professional groups with different educational qualifications to assert themselves as being best qualified to teach health and supervise school health programs. As a consequence, schoolmen in many parts of our country are confused as to what constitutes effective and balanced programs of school health education, and who should be at their helms. The public schools are in particular need of assistance and guidance in matters pertaining to the teaching of health and to the application of hygienic and sanitary measures which insure healthful living and health services.

Scientifically and pedagogically sound school health programs will be forthcoming only when the teachers and supervisors of school health are adequately educated and trained for this work. Therefore the Committee on Professional Education of the American Public Health Association is of the opinion that the most significant contribution it can make to the modern school health movement is to determine and recommend what should constitute the professional educational qualifications, with particular reference to the basic sciences, of young men and women who anticipate school health work as careers.

The Sub-Committee on the Educational Qualifications of School Health Educators of the Committee on Professional Education, after consultation with a number of recognized leaders in the field of school health work, submits its report and recommendations. However, in submitting this report, the subcommittee is mindful of the fact that many men and women in our country who may not be able to measure up to all of the professional educational

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qualifications specified in this report, have contributed and are contributing immeasurably to the modern public school health education movement. Assuredly, men and women with these interests and activities who are included in this group, should be encouraged to continue in this work. The professional educational qualifications specified in this report should be regarded as something to strive for or work toward, rather than as an educational requirement to be demanded in the near future. The program of study put down in this report should be considered as a guide to the young man or young woman in the college who is looking forward to school health work as a profession.

As the sub-committee views it, the professional education of a young man or young woman who anticipates a successful and effective career in school health education falls into three groups of studies:

1. *Scientific Education*—Substantial education in those sciences which acquaint one with the human body, its make-up or structure, its workings or functions including development and growth, and its protection and care.

2. *Pedagogy*—Studies of those subjects which acquaint one with the history, philosophy, psychology, principles and practices of public school education, in order to make a genuine schoolman or schoolwoman out of the prospective health educator and in order to meet the requirements for teachers' certification or licensure.

3. *Special*—Methods and Materials in health teaching. Special health problems and needs of the child. Healthful school living. School's health service.

I. SCIENTIFIC EDUCATION

The first essential in effective teaching is to know thoroughly the subject matter to be taught. The first interest, on the part of a superintendent or principal of a school in his consideration of a prospective teacher of chemistry, would be how much chemistry does the candidate know? What has been the quality and quantity of his training in chemistry? Having satisfied himself on this point, the school administrator would then attempt to appraise the candidate's knowledge of pedagogy in general and of his knowledge of special methods and materials for teaching chemistry. The candidate's knowledge of general pedagogy and of special methods and materials in teaching chemistry is gained, generally speaking, from courses pursued in a teachers' college. Precisely the same attitude should be taken toward the qualifications of the teacher or supervisor who is being considered for school health work. Certainly, a working knowledge of those sciences which acquaint one with the structure or make-up, workings or functions, and the care of the human body-machine, should be regarded as the primal requirement of the candidate for a position of teacher or supervisor of a public school health education program. Studies of human anatomy, both gross and microscopic, including embryology and genetics, acquaint one with the make-up and development of the human body. Knowledge of the workings, functions, and growth can be gained only through studies of physiology, biochemistry, and psychology. To know how to take care of the human body-machine, one must have had substantial education in the fundamentals of physiologic or individual hygiene and of community hygiene for a population group as a whole or for special groups such as industrial in hygiene, as well as in those sciences which acquaint one with the nature of morbid processes which incapacitate or destroy the body; namely, bacteriology and general pathology. The courses in hygiene and their contents which should be pursued in order to qualify for school health teaching and supervision may be put down as follows:

1. *Physiologic Hygiene*—Physiologic, personal, or individual hygiene should include due consideration of the following factors: (1) Air—modern conception of ventilation including shelter—housing, clothing; (2) Water—physiologic and daily hygienic needs; (3) Nutrition—the balanced diet, as measured in terms of proteins, carbohydrates, fats; vitamins and minerals; (4) Light—illumination, ultra-violet rays; (5) Body poisons—bacterial poisons, drugs, chemicals—industrial hygiene; (6) Mental hygiene and the social and economic factors involved in body-mind-emotional disorders; (7) Mechanical world—with particular reference to violence, injury, accidents; (8) Periodic health examinations; (9) Nature—early detection, correction or control of body-mind-emotional defects which are prone to come on during the several age periods of life; (10) Special physiology and hygiene of the several systems in the body including the sense organs and sex physiology and hygiene; (11) Physiology and hygiene of exercise; and (12) Rest, sleep, and avoidance of fatigue.

2. *Community Hygiene* — One's knowledge of the principles and practices of community hygiene must be built on a course in general bacteriology and should be gained in the pursual of a general course in communicable diseases and epidemiology which includes the following topics: (1) Nature and classification of parasites responsible for communicable diseases; (2) Source of communicable diseases—man and animal; (3) Principles and practices of direct and indirect contact infection; (4) Classification of parasitic diseases according to discharges; (5) Routes over which communicable or parasitic diseases are disseminated; (6) General methods for blocking these routes, including water purification, sewage and refuse treatment and disposal, food and milk control, and eradication of diseases conveying insects; (7) Specific procedures for blocking certain communicable diseases including the classification and use of biologics; (8) Epidemiological procedures.

3. *Public Health Administration*—Certainly one who anticipates a career in health education, whether public school health education or adult public health education—popular health instruction—should possess a working knowledge of public health administration or applied hygiene; the principles and practices of physiologic hygiene and of community hygiene as applied to a community as a whole or to maternity and infancy, to children including school health work, and to adults including industrial hygiene. The special interests and activities and personnel of a public health department, including public health statistics, epidemiology, sanitation, laboratories, public health nursing, and so on, should be familiar to one who anticipates a career in school health education, not only for purposes of instruction but also for tying up more closely the health interests and activities of the school with those of the local health department. Some field observation and work is highly recommended.

II. PEDAGOGY

The teacher or supervisor of a public school health education program should be a genuine schoolman or schoolwoman in every respect, one who "understands and can speak the language of public school education," one versed in and permeated with the spirit and atmosphere of the public school educator. Therefore, studies in the history, philosophy, psychology, principles and practices of education should be followed with a view of meeting the requirements for certification and with a view of becoming permeated with the atmosphere

of public school work. Teachers or supervisors of public school health education should meet the same requirements for certification as are now met by schoolmen and schoolwomen in general. In so doing, not only is the desired public school education spirit engendered in the prospective health educator, but pursual of these studies in pedagogy, obviously, should decidedly enhance the capacity for effective teaching. Of course health education will always be interested in any improvement in the contents or interrelation of these courses which will contribute to more effective teaching in general.

III. SPECIAL EDUCATION

1. *Methods and Materials in Health Teaching*—The school health educator should be familiar with methods and materials in health teaching. Many studies and contributions in recent years, have been and are being made to health teaching in the various grades, both as independent instruction and in correlation with other school subjects and of the rôle that the classroom teacher should play in the school's health program. Obviously, all these matters pertaining to health teaching should be given due consideration in a course or courses prescribed in a professional curriculum for the training of health educators.

2. *Special Health Problems and Needs of the Child*—Special education and training relative to the health needs of the child are required of him or her who is to function adequately in school health teaching and supervision. A course or courses should be presented with a view of correlating and applying those medical-health sciences specified above (Scientific Education), to the living, growing, dynamic child. Due consideration should be given to the significant changes in structure and function throughout the period of growth of the child and with its health needs arising out of conflicts between environmental factors and the child's growth and developmental needs. Such special health factors as nutrition; mental hygiene, including personality and child guidance; periodic health examinations; prevention, early detection, and correction of defects; protective inoculations; school epidemiology, and sanitation; should be given their due consideration in this course.

3. *Healthful School Living* includes such factors as the hygienic planning or arrangement of the school program, teacher-pupil relationships, interest in the whole life of the child, home and school, with a view of doing something salubrious about it. Interests and activities for healthful school living may be regarded as the "doing" or laboratory phases or aspects of health teaching.

4. *School Health Service*—The interests, activities, organization, and administration of the school's health service should be an important part of the educational and training equipment of the school health educator. The health service should be regarded as another of the "doing" or laboratory aspect of the school's health program. Some would combine the interests and activities of healthful school living with those of the health service. Naturally, the relation of the health service to the family physician should be duly considered. Of course, in school health programs, it is desirable that health teachers participate to their fullest capacities in the "doing" or laboratory phases of a school health education program. Likewise, those whose interests are primarily in the health service work should take part in teaching. Both principles-teaching and practice-participation should be expected of all who take part in the school health program. Those who participate in the school

health program as teachers or supervisors should be alert to the health aspects of living in the school and have a responsibility also for guiding classroom teachers not only in the recognition of health problems, but also in the effective handling of them. It is understood that this education and training specified under " Special Education " should be so presented that the student will possess a clear picture of a correlated and balanced school health program as a whole, both in respect to health teaching and administration of the school health program.

If we accept the proposition that these 3 groups of studies, (1) Scientific Education, (2) Pedagogy, and (3) Special Education, should be regarded as essential for the preparation of the teacher or supervisor of school health education, it is obvious that the professional education of the school health educator should be done in a university in which the so-called basic health and medical sciences are offered; namely, anatomy, physiology, bacteriology, pathology, and hygiene, and in which a department or school of education is maintained or in other institutions of higher learning where close coöperation exists between these teaching units. In general, the progression to be followed in preparation for a career in school health education may be outlined as follows:

IV. UNDERGRADUATE WORK

The college work should be on a broad cultural basis. However, if one anticipates and plans his studies for a career in health education, early in college life, the necessary physical and biological sciences may be adequately pursued. At any rate, substantial courses should be completed in physics, chemistry, and biology. If possible, biology should include vertebrate anatomy, physiology, and a general course in bacteriology. General courses in psychology and sociology should be completed.

The senior year or a portion thereof should be devoted to studies, offered in the department or school of education in the university, along the lines of the history, philosophy, psychology, principles and practices of public school education. It is assumed that practice teaching is included. The prescribed or recommended courses which will qualify one for the teacher's certificate or licensure should be completed. In other words, according to this recommended course of study in the college, the student has been educated and trained for a career as a public school teacher with a major in the biological sciences and a minor in the physical sciences.

V. GRADUATE WORK

The admission requirements to the graduate school (Bachelor's degree), should specify the completion of substantial courses in the physical and biological sciences and in pedagogy according to the recommendation made relative to undergraduate work. At least 1 year of graduate work leading to the degree of Master of Science in Public Health or School Health Education or an equivalent degree or certificate is recommended. The following graduate program of study is recommended:

Sciences—Those sciences which acquaint one with the structure, functions, and care of the human body.

1. Anatomy—Gross and Microscopic—Embryology
2. Physiology, including Biological Chemistry
3. Physiologic Hygiene (Personal Hygiene)
4. Pathology (Bacteriology prescribed for entrance)
5. Community Hygiene
6. Public Health Administration

School Health Program—Organization and administration of comprehensive and con-

structive school health programs including:

1. Methods and Materials in Health Teaching
2. Special Health Problems and Needs of the School Child
3. Healthful School Living
4. The School's Health Service

It is recognized that the program of study offered as graduate work will be varied in accordance with the undergraduate education and training of different students. For example, public school health educators are now being recruited from several of the health-medical professions; namely, medicine, dentistry, nursing, nutrition, from physical education, and from public school educators who have majored in the biological and, perhaps, the social sciences. The physician going into school health work will have had satisfactory training in the sciences before he begins this curriculum. He may have had none of the courses which make up pedagogy. Therefore, courses in the history, philosophy, psychology, principles and practices of public school education must be made available to him in this graduate program of study. Likewise, in varying degrees, for the other health sciences' professions. On the other hand, physical educators and schoolmen interested in school health work as careers, ordinarily, will have to devote much of their time and efforts to the study of the medical-health sciences. Thus, it is seen that the graduate program of study will have to be modified or differentiated in order to meet the individual needs of professional students until that time comes when professional education programs of study for school health educators will become generally recognized and established.

VI. PRACTICAL EXPERIENCE

One cannot emphasize too much the importance of supervised practise teaching of health and of directed participation in the "doing" aspects of the school's health program including the activities for healthful school living and those of the health service, in order fully to qualify as a school health educator. Therefore, a tenure of directed practice and experience in a recognized school health program should be included in a professional program of study in school health supervision before the Master's degree is conferred. Obviously, in school health teaching and supervision, wholesome, positive, dynamic health should be an outstanding characteristic of one who is to be at the helm of the school health program. This should be regarded, perhaps, as the outstanding personality qualifications to be required of the teacher and supervisor of a school health program.

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Preliminary Report of the Sub-Committee on the Educational Qualifications of Adult Health Educators*

IN times past, public health agencies were almost wholly concerned with the prevention and control of communicable diseases. The greatest accomplishments have been made in the control of certain diseases by legislative enactment, enforcement of regulations, and supervision. This is particularly the case with those bacterial diseases which are spread by indirect contact infection, as in water, milk, food, and by insects. Water purification, sewage treatment and disposal, pasteurization, food inspection and control, drainage, and so forth, have eliminated or minimized the dangers in our country of those parasitic diseases which made up the formidable epidemics and pandemics.

As a result of the great accomplishments of public health in prevention and control of communicable diseases, the new public health is becoming more interested in personal hygiene, including such health factors as periodic health examinations; the prevention, early detection, and correction of body-mind-emotional defects including the defects which are prone to come on during the various age periods of life, including degenerative diseases and cancer; nutrition; mental hygiene; ventilation; and other factors which may be specified. Obviously, we cannot set up laws, establish mechanisms, and employ experts to deal adequately with the several factors which are included in physiologic hygiene. Progress and achievement in physiologic hygiene can be brought about only by means of popular health education. This is also true, in a very large measure, of our efforts to deal with those diseases which are spread by direct contact infection.

Thus, it is seen that the education of the masses in the fundamentals of public health has become one of the outstanding interests and activities of the modern public health movement. We must now begin to look at the public health educator as one of the most important functionaries in modern public health and look to his education and qualifications in the same way in which we do the education of other types of public health personnel.

RECOMMENDATIONS

The Sub-Committee on the Educational Qualifications of Health Educators (Adult Health Educator-Popular Health Educator) of the Committee on Professional Education, after consultation with a number of recognized leaders in the field of popular or public health education, submits this report. The report should serve as a *guide* to young men or women who are

* The Committee on Professional Education of the American Public Health Association publishes this Report of the Sub-Committee to permit the members and Fellows of the American Public Health Association to review it and to offer criticisms and suggestions to the Committee in the further consideration of the report.

looking forward to this important and promising field of public health as careers.

The professional education of the public health educator falls into 3 general groups of studies: (1) Scientific Education, (2) Methods and Materials in Public Health Education and Publicity, (3) Practical Field Work Experience.

1. *Scientific Education*—All public health interests and activities center in the human body and its welfare. Obviously, in order for the public health educator to function adequately in popular health education, he should possess a substantial education in those sciences which acquaint him with the make-up or structure, the workings or functions, and the care of the human body as a whole. A working knowledge of these sciences adds immeasurably to the effectiveness of the public health educator, and enables him to realize the relative values and social significance of disorders toward which health education is directed.

Human anatomy, both gross and microscopic, including embryology and genetics, acquaints one with the structure and development of the body. A knowledge of physiology, biochemistry, and psychology is essential in order to understand the function, growth, and development of the body as a whole. To know how to take care of the human body, one must be familiar with those sciences which give him knowledge of the nature and causes of morbid processes; namely, bacteriology and pathology. One must have had also some substantial courses in hygiene, public health, and preventive medicine including the fundamentals of physiologic hygiene, community hygiene and epidemiology, and public health administration in general.

2. *Methods and Materials in Public Health Education and Publicity*—The technic of public health adult education differs from that of school health education in several respects. For the latter, courses in the history, philosophy, psychology, principles and practices of public school education are recommended and prescribed in order to make a genuine school man or woman out of the prospective school health educator and in order for him or her to qualify for certification. While some knowledge of the principles and practices of education is desirable and essential for the public health educator, the sub-committee does not feel that it is essential at this time to prescribe as extensive a study of those educational courses specified for the school health educator. It is of the opinion, however, that the public health educator should have had some substantial courses in the philosophy and psychology of public school education and of adult education. Assuredly, he should possess a working knowledge of the philosophy and psychology of education as these are applied to adult education. Methods and Materials in Adult Health Education should be familiar to him. Almost daily, new studies and contributions are being made to this subject. In addition to these important basic subjects which acquaint one with the educational aspects of public, popular, or adult education, the special technics of adult health education should be given due consideration in the professional education of the public health educator. These are: public speaking; journalism; feature writing; community newspaper; radio and visual education, including placards, posters, stereopticon, and cinema; demonstration, including exhibits, fairs; perhaps some instruction in the psychology of writing and advertising.

3. *Practical Field Experience*—The sub-committee is of the opinion that

at least 3 months of supervised practical experience in a public health department or agency in which recognized public health education is being effectively carried on should be stipulated for the public health educator of the future.

The extent of study of all the courses stipulated above and their contents need not be put down in this report. The contents of courses in anatomy, physiology, psychology, biochemistry, bacteriology, and pathology are fairly well determined. Whether the contents of these courses as now being prescribed for medical students, should be taken by students going into the several fields of public health work for which preparation in medicine is not a requisite, is a matter that will be taken care of in the future. Perhaps, for the present, special courses can be arranged for students in public health. It is anticipated and recommended that all the courses advised: in the sciences, in education, and in methods and materials in public health education, including those subjects which acquaint one with the several avenues of public education, be given as comprehensively and substantially as possible.

In view of the interest expressed by those from whom opinions have been sought relative to the formulation of this report, in the contents of courses recommended in hygiene and public health, the suggested make-up of physiologic hygiene, community hygiene, and public health administration are herewith stipulated:

1. *Physiologic Hygiene*—Physiologic, personal, or individual hygiene should include due consideration of the following factors: (1) Air—modern conception of ventilation including shelter—housing, clothing; (2) Water—physiologic and daily hygiene needs; (3) Nutrition—the balanced diet, as measured in terms of proteins, carbohydrates, fats; vitamins and minerals; (4) Light—illumination, ultra-violet rays; (5) Body poisons—bacterial poisons, drugs, chemicals—industrial hygiene; (6) Mental hygiene and the social and economic factors involved in body-mind-emotional disorders; (7) Mechanical world—with particular reference to violence, injury, accidents; (8) Periodic health examinations; (9) Nature—early detection, correction or control of body-mind-emotional defects which are prone to come on during the several age periods of life; (10) Special physiology and hygiene of the several systems in the body including the sense organs and sex physiology and hygiene; (11) Physiology and hygiene of exercise; and (12) Rest, sleep, and avoidance of fatigue.

In the study of these factors which make up physiologic hygiene, the relative values of each for the various age groups should be emphasized. Differentiation should be made between those factors based on scientific experimentation and observation and those which are based largely on opinion or empiricism. Fads and frauds are common in respect to several of these factors. Therefore, they should be given due consideration in the course in order that the public will be told about them later on. The rôle that the home, school, and community should play in the comprehensive and constructive program of physiologic hygiene should be clearly brought out in the courses.

2. *Community Hygiene* — One's knowledge of the principles and practices of community hygiene must be built on a course in general bacteriology and should be gained in the pursual of a general course in communicable diseases and epidemiology which includes the following topics:

(1) Nature and classification of parasites responsible for communicable diseases; (2) Source of communicable diseases—man and animal; (3) Principles and practices of direct and indirect contact infection; (4) Classification of parasitic diseases according to discharges; (5) Routes over which communicable diseases or parasitic diseases are disseminated; (6) General methods for blocking these routes, including water purification, sewage and refuse treatment and disposal, food and milk control, and eradication of disease conveying insects; (7) Specific procedures for blocking certain communicable diseases, including the classification and use of biologics; (8) Epidemiological procedures.

3. *Public Health Administration*—Certainly one who anticipates a career in health education, whether public school health education or adult public health education—popular health instruction—should possess a working knowledge of public health administration or applied hygiene; the principles and practices of physiologic hygiene and of community hygiene as applied to a community as a whole or to maternity and infancy, to children (including school health work) and to adults (including industrial hygiene). The special interests and activities and personnel of a public health department, including public health statistics, sanitation, epidemiology, laboratories, public health nursing, and so on, should be familiar to one who anticipates a career in adult health education. Some field observation and work is highly recommended.

PROGRAM OF STUDY

Following the general procedure of the Committee on Professional Education of the American Public Health Association, to recommend professional educational qualifications for personnel in several fields of public health on as high a level as possible with a view of meeting the future needs as it sees the problem, and with a view of serving as a guide for those who anticipate careers in public health education, the following program of study is recommended:

1. *Undergraduate Work*—The college work should be on a broad cultural basis. Substantial courses in English and particularly in composition and writing; public speaking; philosophy; biology; chemistry; psychology; sociology; and government should be completed. During the upper-classmen years, such subjects as the philosophy and psychology of public school education and of adult education should be included. There should be a thorough preparation for graduate work, but this need not be done in a manner to sacrifice the broad cultural interests in education.

2. *Graduate Work*—The admission requirements to the program of study in public health education should be graduation from a recognized college. The under-graduate work should include those courses prescribed. The degree of Master of Science in Public Health or Public Health Education, or its equivalent such as the certificate, should be conferred upon the satisfactory completion of the following curriculum and after the successful completion of the practical field experience. Of course, it is understood that this program of study will be subject to much modification in view of the fact that students will enter it with considerable variation in the previous college education. For example, those going into this field from the medical profession will already have completed the health-medical sciences and, as a rule, will be deficient in the educational courses.

The courses recommended in this

program of study in public health education offered as graduate work include:

1. Anatomy—Gross, Microscopic—Embryology
2. Physiology, including Biological Chemistry
3. Pathology
4. Physiologic Hygiene
5. Community Hygiene
6. Public Health Administration, including Public Health Statistics

The other subjects prescribed in the graduate school should include certain courses which acquaint one with the technic of adult health education; namely:

1. Philosophy and Psychology of Adult Education
2. Methods and Materials in Adult Health Education
3. Feature Writing
4. Advanced Public Speaking
5. Community Newspaper
6. The Significance of Demonstration and Fairs in Public Education
7. Cinema and Radio in Adult Education
8. Psychology of Advertising — Posters, Placards, etc.

After the completion of this curriculum, 3 months of directed practical work in public health education in a recognized health department or agency should be required before the Master's degree or certificate is prescribed.

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Institutional Mortality With Reference to Residence Allocation*

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THE statistical treatment of deaths in state and federal institutions is a matter of importance, because these deaths form a considerable proportion of the total mortality, and an even greater part of the specific mortality from certain causes. In New York State, exclusive of New York City, for example, the inmates of state and federal institutions in 1935 represented 1.5 per cent of the population, but were responsible for 6.5 per cent of all deaths, 21.8 per cent of the deaths from tuberculosis, and 9.8 per cent of the deaths from pneumonia.

If the weight of the institutional mortality is considerable in an area as populous as the state, even without New York City, it is a factor of much greater importance in the small cities or rural areas in which many institutions are located. Take, for example, the rural section of one of the New York counties, Dutchess, which has two state hospitals, a State School for Mental Defectives, and a Veterans' Administration Facility within its boundaries. In 1935, of 1,393 deaths recorded in the county, 788, more than half, occurred among the institutional population of 11,344, while the rest, 605, represented the mortality among the general population of 46,003. The death rate of the area, based on the total mortality, including that in institutions, was 24.3, but only 13.2 when the deaths and population of the institutions were excluded. The high rate of 24.3 surely cannot be taken as a measure of mortality in the rural area of Dutchess County because most of the inmates of the institutions were non-residents of the county, and in the case of the federal hospital, non-residents even of the state.

The need for a correction of the death rates is, therefore, self-evident. The method employed by the U. S. Bureau of the Census in allocating deaths of non-residents to place of usual abode does not solve the problem, because for inmates of a custodial institution the "usual place of abode" is defined as the institution. At the same time, the institution is considered an integral part of the area in which it is located. The error contained in the death rates produced by this method of allocation, which has the outstanding advantage of simplicity, would be largely eliminated if the deaths and population in institutions were shown

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* Read at a Joint Session of the State Registration Executives and the Vital Statistics Section of the American Public Health Association at the Sixty-fifth Annual Meeting in New Orleans, La., October 22, 1936.

From the Department of Biostatistics of the School of Hygiene of The Johns Hopkins University, Paper No. 202, and the Division of Vital Statistics, State Department of Health, Albany, N. Y.

separately from those in the communities in which they are located.

Another way of dealing with the problem would be to change the definition of residence as applied to inmates of custodial institutions, and allocate all deaths among them to the place of residence at the time of admission. That the population of the institutions cannot be similarly allocated need not cause concern, since the resulting error in the death rates is negligible—probably less than that caused by errors in ordinary estimates of population.

The principal arguments against this procedure arise from the fact that, on the one hand, many of the deaths are caused by diseases which originated or were first diagnosed in the institutions, and, on the other hand, many deaths follow such long periods of institutional life as to make their statistical transfer to former place of residence a questionable procedure. Here it is desirable to formulate clearly what one wishes to accomplish by means of allocation of deaths. One may either attempt to measure the mortality among residents of the several municipalities of the state, regardless of their movement within the state, or even beyond its boundaries, or to determine as accurately as possible the number of deaths from causes which had their inception in these municipalities. The distinction between these two concepts has been expressed most graphically by the late Dr. Stevenson, who in a letter to Dr. DePorte defended the allocation of all deaths, regardless of cause, to place of residence, institutional deaths to be transferred to the place of residence prior to admission:

> I am struck by a fundamental difference, of which I was already aware, between your conception in America of the task to be undertaken and ours. We aim merely at ascertaining the mortality experienced by each area, and not that for which it is responsible. Thus, for instance, in the case of deaths from violence we allocate these by preference to the district of residence, which is entirely ignored in your rules. We are both logical in what we do, but you aim higher than we.
>
> I do not claim that our residential mortality basis always yields ideal results. It does not; but I think its simplicity and practicability are advantages far outweighing its disadvantages. When we get an outbreak of infectious disease in an asylum we are obliged to distribute the deaths to the area from which the patients were admitted, and in this particular case I can see advantage in your rule 4. But to adopt it to meet this special difficulty would be for us to admit the thin edge of the wedge, and after all it seems to me that one of the dangers of life in any area is that you may go mad and be sent to an asylum where you may be infected with typhoid or dysentery.

Dr. Stevenson's remark that the aim of the New York State Health Department is higher than that of the office of the English Registrar General is, of course, only gentle sarcasm.

What the New York State Department has been endeavoring to do is to achieve a workable synthesis between the two points of view. It seemed to us that to allocate to place of residence deaths from automobile accidents, for example, or deaths resulting from diseases definitely known to have been contracted away from home, was not good logic. At the same time, in the case of chronic diseases, it is often impossible to ascertain where the disease had its inception; in such cases, the allocation has been to place of residence.*

If the mortality in state institutions is considered from this point of view, there can be little question about transferring to place of residence at time of admission the deaths from epilepsy, general paralysis of the insane, and dementia praecox—illnesses responsible for the admission of patients to institutions. It would also seem reasonable

* For rules of allocation employed by the New York State Department of Health, see the *Annual Reports* of the Division of Vital Statistics.

to charge an institution with deaths from acute communicable disease. One cannot, however, make such a clear-cut decision in the large group of deaths from chronic diseases, such as tuberculosis, cancer, diabetes, diseases of the circulatory system. To this group may be added the deaths from pneumonia, with which an institution would have to be charged if pneumonia is considered an acute infectious disease.

In order to determine what would be the most equitable distribution of institutional mortality, it would be very desirable to know of what this mortality consists—the causes of death, the interval between admission and death, and in the case of tuberculosis the number of deaths in which the disease apparently originated in the institution.

In 1935 in New York State, exclusive of New York City, 4,441 deaths were recorded in state and federal institutions. Of these, 348 were recorded in the Veterans' Administration Facilities. Since most of these hospitals admit patients for treatment rather than for permanent custody, the deaths in them do not present the same problem as the deaths in state institutions, and therefore they have not been included in the following tabulations. Similarly, 6 deaths in the State Hospital for Tuberculosis and 3 in the West Haverstraw Reconstruction Home (for orthopedic cases) have also been excluded. In New York State, institutions constitute separate registration districts. Each year a certain number of deaths of persons other than inmates (attendants, etc.) are registered in these institutional districts. It was considered impractical to exclude them from the 3,669 deaths in the state hospitals—they certainly form a very small percentage of the total. The deaths of persons who were not inmates have, however, been excluded from the records of all other institutions.

This leaves a total of 4,072 deaths—3,669 in hospitals for the insane, 212 in schools for mental defectives, 136 in Craig Colony for epileptics, 39 in prisons, 16 in other institutions.* The distribution of these deaths according to cause is shown in Table I.

It is seen that only 423, or 10.4 per cent, of the deaths were caused by general paralysis of the insane, dementia praecox and other psychoses, and epilepsy, and only 595, or 14.6 per cent by these diseases, cerebral hemorrhage, and other diseases of the nervous system. Diseases of the heart, diseases of the arteries, and acute and chronic nephritis were responsible for 43.8 per cent of the total. Tuberculosis and pneumonia each caused somewhat more than one-tenth of all deaths—10.8 and 10.9 per cent respectively.

These percentages remain practically unchanged if one considers only the state hospitals for the insane. In schools for mental defectives, tuberculosis was the most important cause of death, accounting for 22.2 per cent of all deaths, with pneumonia second and diseases of the heart third. In Craig Colony for Epileptics, 37.5 per cent of the deaths were ascribed to epilepsy, 25.7 per cent to pneumonia, and 8.8 per cent to tuberculosis. These differences are explained in part, at least, by the younger age distribution of the population in Craig Colony and the state schools.

Of the 39 deaths in prisons, 16 were legal electrocutions.

Tabulation of the deaths by length of stay in the institution shows that 40 per cent of all deaths were recorded within a year after admission, 71 per cent within 5 years. The median length of stay in all institutions was

* One in Westfield State Farm, 1 in the State Training School for Girls, and 14 in the Women's Relief Corps Home.

TABLE I

Deaths in State Custodial Institutions by Cause of Death: New York State (Exclusive of New York City), 1935

Cause of Death	New York State (Excl. of New York City)	All State Custodial Institutions	Hospitals for the Insane	Schools for Mental Defectives	Craig Colony for Epileptics	Prisons	Others
All causes	73,376	4,072	3,669	212	136	39	16
Tuberculosis, all forms	3,056	438	373	47	12	6	..
Pulmonary	2,839	424	363	43	12	6	..
Other forms	217	14	10	4	..	..	..
Syphilis	414	67	62	1	..	4	..
Other infectious diseases	1,497	46	32	13	1	..	..
Cancer and other malignant tumors	8,631	170	161	6	2	1	..
Diabetes mellitus	1,966	51	49	2	..	..	..
Cerebral hemorrhage, cerebral embolism and thrombosis	5,830	142	130	6	4	..	2
General paralysis of the insane	362	330	329	1	..	..	..
Dementia praecox and other psychoses	30	14	14	..	..	..	..
Epilepsy	150	79	25	3	51	..	..
Other diseases of the nervous system	798	31	19	11	1	..	..
Diseases of the heart	21,018	1,281	1,229	31	7	3	11
Diseases of the arteries	1,942	236	235	..	..	1	..
Pneumonia, all forms	4,633	443	372	33	35	2	1
Diarrhea and enteritis	374	21	12	9	..	..	..
Nephritis, acute and chronic	6,233	268	251	8	9	..	..
Congenital malformations and diseases of early infancy	2,612	24	8	14	1	..	1
Accidents	4,959	115	105	4	6	..	..
Legal electrocutions	16	16	..	..	..	16	..
All other causes	8,855	300	263	23	7	6	1

TABLE II

Deaths in State Custodial Institutions, by Length of Stay in Institution: New York State (Exclusive of New York City), 1935

Length of Stay in Institution	Total	Hospitals for the Insane	Schools for Mental Defectives	Craig Colony for Epileptics	Prisons	Others
Total	4,072	3,669	212	136	39*	16
Less than 1 year	1,622	1,493	77	26	24*	2
Less than 1 month	*488*	*465*	*15*	*8*	..	..
1 year	458	425	17	10	4	2
2 years	327	295	17	11	3	1
3 years	276	229	34	10	..	3
4 years	206	184	7	13	..	2
5–9 years	380	314	24	32	6	4
10 years and over	760	688	35	34	1	2
Not stated	43	41	1	..	1	..
Median length of stay	1.9	1.8	2.7	4.8	1.9	4.0

* Includes 16 legal electrocutions which were not considered in computing the median.

1.9 years—in hospitals 1.8, in schools for mental defectives 2.7, Craig Colony 4.8, prisons (excluding legal electrocutions) 1.9, and others, 4.0.

The problem of allocation is mainly one for deaths in state hospitals, which account for 90 per cent of the total institutional mortality. Table III shows the distribution of the hospital deaths according to cause and length of stay in a hospital. The median duration of residence varies from about 1 month for deaths from dementia praecox to 4 years for deaths from tuberculosis. This does not mean, of course, that the duration of life of patients entering with dementia praecox is so much less than for patients with other psychoses. Quite the opposite is true. In general, persons with dementia praecox live longer in the institution, but most of them succumb to other diseases.[1]

While the death rate from all causes is definitely higher immediately after admission—12 per cent of all deaths being recorded within a month—the death rate from pneumonia seems particularly high, 18 per cent of all deaths from that cause being recorded within the first month. Only dementia praecox and diabetes show a higher percentage, but the number of deaths from these causes is relatively small. Tabulation of the hospital deaths by age, shows that invariably the percentage of deaths soon after admission is higher for pneumonia than for other causes as a group. There is some evidence that persons subjected to a new environment are more susceptible to pneumonia than

TABLE III

Deaths in State Hospitals for the Insane, by Cause of Death and Length of Stay in Hospital: New York State (Exclusive of New York City), 1935

		Length of Stay in Hospital						
Cause of Death	*Total*	*Less than 1 Month*	*1 Month to 1 Year*	*1–4 Years*	*5–9 Years*	*10 Years and Over*	*Not Stated*	*Median*
All Causes	3,669	465	1,028	1,133	314	688	41	1.8
Tuberculosis, all forms	373	16	38	150	52	114	3	4.0
Syphilis	62	6	24	22	4	3	3	1.0
Other infectious diseases	41	2	10	15	8	6	..	2.4
Cancer and other malignant tumors	161	12	33	43	19	53	1	4.3
Diabetes mellitus	49	11	13	18	1	6	..	1.0
Cerebral hemorrhage, cerebral embolism and thrombosis	130	13	45	35	10	24	3	1.4
General paralysis of the insane	329	33	133	118	17	15	13	1.0
Dementia praecox and other psychoses	14	8	3	1	1	1	..	0.1
Epilepsy	25	3	3	10	4	5	..	3.6
Other diseases of the nervous system	19	3	2	10	4	..	..	3.1
Diseases of the heart	1,229	180	372	365	81	220	11	1.4
Diseases of the arteries	235	22	84	68	17	44	..	1.4
Pneumonia, all forms	372	67	111	95	34	62	3	1.2
Nephritis, acute and chronic	251	34	68	70	28	50	1	2.1
Accidents	105	15	31	35	5	18	1	1.4
All other causes	274	40	58	78	29	67	2	2.4

TABLE IV

Deaths from Tuberculosis in State Custodial Institutions: New York State (Exclusive of New York City), 1935

Length of Residence in Institution	Total		Indicated Duration of Tuberculosis							
	Number	Per Cent	Less than 1 Year	1–2 Years	2–3 Years	3–4 Years	4–5 Years	5–9 Years	10 Years and Over	Not Stated
Total	438	100.0	171	59	25	18	13	27	29	96
Less than 1 year	63	14.5	35	7	..	2	1	..	1	17
1 year	51	11.7	20	17	..	2	1	..	..	11
2 years	60	13.8	26	1	3	..	1	3	..	26
3 years	35	8.0	15	6	2	1	..	..	1	10
4 years	22	5.1	6	2	4	5	2	1	..	2
5–9 years	74	17.0	29	13	8	2	5	5	3	9
10 years and over	130	29.9	38	13	8	6	3	18	23	21
Not stated	3		2	..	..	..	..	..	1	..

if they have resided in a place for a period of time. In so far as this factor operates, institutional life might be said to increase the risk of dying from pneumonia. On the other hand, if length of residence is to be a criterion for the allocation of deaths to previous place of residence, these are the very deaths that could be allocated without question.

For inmates who die from tuberculosis, it is interesting to compare the duration of the illness as given on the death certificate with the length of stay in the institution. Of the 438 deaths from this cause in all institutions, the duration of the illness was stated in 342, or 78 per cent, and averaged 2.8 years (see Table IV). In only 69 cases was the indicated duration greater than the length of stay in the institution. On the other hand, in 171 deaths the duration was given as less than 1 year. This is the interval between diagnosis and death—it is extremely doubtful if the interval between the first manifestations of the disease and death could have been of such short duration in all these cases. For the purpose of allocating deaths from tuberculosis to place of origin of the disease, the information given on the death certificates is hardly adequate.

Deaths in custodial institutions are undoubtedly not in the same category as deaths recorded in other districts of the state. Persons in state hospitals and state schools were removed from their communities because of illness or mental defect. Most of those who die would have died if they had remained at home. Even if conditions of institutional life were the predominating factor—as Dr. DePorte has said elsewhere in discussing the mortality from tuberculosis in these institutions—"the first link in the chain of events was forged in the place in which the patient previously resided."[2]

It seems to us, therefore, that the most satisfactory procedure would be to allocate all deaths in custodial institutions, except those caused by acute communicable diseases, back to the place of former residence, thus distributing the institutional mortality throughout the state. This procedure is an arbitrary one, but probably the most practical solution of the problem in the present state of our knowledge.

REFERENCES

1. Malzberg, Benjamin. *Mortality Among Patients with Mental Disease.* Utica, N. Y., State Hospitals Press, 1934.

2. DePorte, J. V. Recorded and Resident Death Rates from Tuberculosis in New York State in 1926. *Am. Rev. Tuberc.*, XVII, 6 (June), 1928.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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REMEMBER THE EDITORS AND THE PRINTER

PRESUMABLY papers for our 1937 meeting are now in course of preparation. We venture to hope so, and, further, that no hurriedly written papers will be submitted.

We have from time to time submitted certain suggestions, and there is sent out from the office to every one on the program a sheet of plain directions as to manuscripts. It is remarkable how often these simple instructions are disregarded. For example, one of the very first rules in preparing a manuscript is to double space, and submit the original; yet every year we have a number of indistinct carbon copies single spaced, almost impossible to edit, and hard for the printer to set. Usually quotations are allowed to be single spaced. If they are accurate they should not need editing, but this *Journal* prefers to have everything that goes to the printer double spaced.

Short papers are more likely to be read and more likely to be published. But papers can be long at 500 words and short at 5,000, according to their material. The secret of brevity is repeated revision: the author's best friends are a month's delay and several candid critics.[1]

The majority of readers look for facts and conclusions. Those who wish to repeat the work or compare it with other articles on the same subject read the details. A number of very clever articles have been written on medical jargon which includes the overuse of words with abstract meanings: for example, "of a blue coloration" rather than simply "blue"; instead of "in a state of good health," say "in good health," etc.

The writer should not waste space and words in explaining that he believes so and so. We have a right to know that he would not put a statement in his paper if he did not believe it. If some doubt exists he can say "apparently,"

which is just as good as, "I cannot disguise from myself that it would appear that."

We wish that we could impress upon writers that they are assisting not only the editors and printer of the *Journal*, but themselves, in furnishing well prepared manuscripts. Inexact and carelessly written papers entail extra work all down the line and cause unnecessary expense due to necessary corrections and changes, as well as dissatisfaction to the authors, and criticisms of the printer. Wise as editors should be and may be theoretically, they cannot be omniscient. They are not mind readers, so cannot always guess correctly at the meaning of obscure statements.

Editors in various parts of the world are asking their contributors for better manuscripts. Some of the points here noted are from the wail of the Editor of *The Lancet*. From the *Canadian Public Health Journal*[2] we cull this excellent advice:

"If you've got a thought that's happy—
Boil it down.
Make it short and crisp, and snappy—
Boil it down.
When your brain its coin has minted,
Down the page your pen has sprinted,
If you want your effort printed,
Boil it down.
Take out every surplus letter—
Boil it down.
Fewer syllables the better—
Boil it down.
Make your meaning plain—express it,
So we'll know—not merely guess it,
Then, my friend, ere you address it,
Boil it down.
Skim it well—then skim the skimmings—
Boil it down.
When you're sure 'twould be a sin to
Cut another sentence in two,
Send it on, and we'll begin to—
Boil it down."

REFERENCES

1. Supplement to *The Lancet*, Jan. 2, 1937.
2. *Canad. Pub. Health J.*, Oct., 1936, p. 517.

An article on writing for this *Journal* is in course of preparation for distribution to our contributors.

EIGHTH ANNUAL MEETING OF THE WESTERN BRANCH, A.P.H.A.

THE eighth annual meeting of the Western Branch was held in Phoenix, Ariz., April 13 to 15 inclusive, in conjunction with the Arizona Public Health Association, the Arizona Sewage Works Association, a conference of Registrars of the Western States and Territories, and a conference of state nurses of the U. S. Public Health Service and the Children's Bureau. This was the first meeting of the Western Branch in the great Southwest, and a delightful reception was accorded the 300 registered members by the Committee on Local Arrangements. True to its name, at this time of year Phoenix arises from the burning sands of the desert, young and beautiful to glory in a brilliant health giving sun. The committee provided local atmosphere by arranging an inspection trip to points of special interest in the valley, and a barbecue supper outdoors with our hosts and hostesses wearing 10 gallon hats, colorful silk shirts and shirtwaists, riding boots, and spurs. Judging from the difficulties encountered by the Local Committee in getting programs printed and finding meeting rooms, Phoenix is rather disdainful of convention meetings, an attitude hardly in keeping with its reputation as a health resort. Despite these backstage troubles, Western Branch

members felt that they were accorded a hearty, sincere, Western brand of hospitality.

H. E. Young, M.D., Health Officer of British Columbia, venerable and revered Dean of the western state and provincial health officers now remaining in active service, presided at the opening session, the annual dinner, and all business sessions. He was at his best at the dinner. Old in service but young in ideas and future vision, Dr. Young stated:

> The future holds great promise for the Western Branch. It now encompasses 3 provinces of Canada, 11 western states, the Territory of Hawaii, and the Territory of Alaska. It is in these areas that public health advances will be most marked in the immediate future. In these areas we encounter several unique public health problems. It is in the West that public health personnel will be greatly augmented in the years to come. Let us continue to join together for purposes of mutual exchange of experience and ideas, for keeping in closer touch with our eastern colleagues, for welcoming our younger colleagues into the fraternity of public health and helping to make their path a little smoother, and for building public opinion to the point where it will support adequate public health programs in the West.

This meeting attracted more national authorities than heretofore. There was an interesting paper on public health problems encountered by cities entertaining conventions, an important contribution on the actual technics of using the radio for public health purposes, a helpful paper bearing the authority of the U. S. Public Health Service on planning venereal disease programs in local health units, a public health challenge presented by the newer methods of pneumonia diagnosis and treatment of special interest in Arizona where the death rate is among the highest, an interesting discussion of resident allocation of death reports indicating a sympathetic and helpful attitude by the Bureau of the Census, a stimulating and thought provoking paper on the application of the newer principles of mental hygiene to health department activities, an authoritative and informative discussion on industrial tuberculosis of special interest to the mining industries of the Southwest, an excellent suggestion concerning the need for a central clearing house for public health legislation, a timely paper concerning the responsibilities of public health nurses under the expanding Social Security program, and many others of equal note.

Among the items lending local color to the program was a discussion and demonstration of the Burr cottage for the home treatment of tuberculosis where no sanatorium is available, a description and demonstration of the Arizona Healthmobile, consisting of an automobile trailer with complete X-ray equipment and facilities for tuberculin testing. There was good attendance from the Indian Medical Service of the Southwest, and an interesting paper was presented concerning coöperation between the Indian Service and the local health department.

The Western Branch now has 688 Active Members and Fellows on its rolls, the largest number ever recorded in the West.

New officers elected were as follows:

President, Platt W. Covington, M.D., Salt Lake City, Utah
President-elect, Guy S. Millberry, D.D.S., San Francisco, Calif.
Vice-President, G. F. Amyot, M.D., D.P.H., Vancouver, B. C.
Vice-President, Lewis H. Howard, M.D., Tucson, Ariz.
Vice-President, Olive Whitlock, R.N., Portland, Ore.
Secretary, W. P. Shepard, M.D., San Francisco, Calif.
Treasurer, W. F. Higby, San Francisco, Calif.

New Regional Board members elected for a term of 2 years were: Malcolm R. Bow, M.D., C. J. Gillespie, Paul M. Fox, I. O. Church, M.D., and Jane Rider. Elected for 1 year: S. M. Creswell, M.D.

Dr. Church, Health Officer of Alameda County, Oakland, Calif., was elected *Chairman of the Executive Committee*. The next meeting will be held in Portland, Ore., late in May or early in June, 1938. Next year marks the 35th anniversary of the founding of the Oregon State Board of Health.

See August Journal for:

Western Branch A.P.H.A. Papers by Karl F. Meyer, Ph.D., M.D., Allan Blanchard, and James A. Tobey, Dr.P.H.

Also

How Much Control of Tuberculosis?

By W. H. Frost, M.D.

The Supervising Nurse

By J. Rosslyn Earp, Dr.P.H.

Also

PRELIMINARY PROGRAM, 66TH ANNUAL MEETING

Letter from Great Britain

LONDON COUNTY COUNCIL MEDICAL SUPPLEMENT

The collection of papers and reports on medical subjects by members of the hospital staffs of the London County Council which makes up one of the parts of the Annual Report of that body, contains matter of interest and importance to physicians and health officers in general and everywhere. This is my excuse for making reference to certain of the more outstanding contributions. The range of subjects dealt with is very wide; naturally, since the hospital service covers a great variety of institutions. Amongst these are what are described as "special hospitals," which include, in addition to a number of infectious disease hospitals, sanatoria and hospitals for tuberculosis, hospitals for treatment of venereal disease, for the treatment of diseases of the ear, for skin diseases, etc. Further, there are special units situated in special or general hospitals for, amongst other conditions, puerperal fever, radiotherapy, congenital syphilis, and arthritis, with clinics for diabetes and goitre. From each of these and from the officer in charge of the maternity operations of the Council, there come special reports or communications. In addition, there are papers on cases of exceptional interest from the general hospitals, such as agranulocytosis, idiopathic steatorrhoea and so on, all helping to make of the report quite a useful informative addition to the medical literature published in the year reported upon.

A REPORT OF DIPHTHERIA

In the reports classed as from isolation hospitals, there are references to work done in relation to diphtheria, cerebrospinal fever, acute poliomyelitis, scarlet fever, and whooping cough. Speaking generally, diphtheria in the year under review appears to have been of a mild type. Hospital case mortality rates varied from 1.5 to 3.9 per cent. Again, as in so many reports, not only from London but elsewhere, strong insistence is made of the fact that in nearly every case in which death supervened, specific treatment was not applied "until the disease was so far advanced as to make antitoxic therapy virtually hopeless. Irreparable and lethal damage," in fact, "had occurred before the patient was admitted to hospital." That there was a low incidence of laryngeal diphtheria is noted. In the discussion on methods of treatment, it is mentioned that glucose in concentrated solution given by the intravenous route has been in general use. Amongst investigations at various of the hospitals, that made with the object of determining as to the existence or otherwise of vitamin C deficiency in this disease are worth mentioning, even though all the report has to say is that the results are incomplete, but sufficient has been done to demonstrate that there is a definite deficiency in diphtheria. This is important since, judging from experiments on guinea pigs, deficiency of vitamin C indicates a lowered resistance to diphtheria toxin.

SCARLET FEVER INVESTIGATIONS

The scarlet fever report contains discussion of a number of points of interest and importance; amongst them the results of serum treatment, the most suitable date for release from hos-

pital, and the Dick response in cases of scarlet fever after an average stay in hospital. In regard to the use of scarlet fever antitoxin in treatment, most of the hospitals in which it is used report favourably pointing particularly to the low incidence of important complications, such as otitis media, mastoiditis and nephritis. The duration of stay in hospital is also reduced, though, generally speaking, nowadays the tendency all the time in fever hospitals is to discharge patients very much earlier than formerly. In one hospital, out of 716 patients it was found that nearly 50 per cent were discharged within 5 weeks of admission. The investigation into the question of the Dick response after an average stay in hospital was made along lines adopted in an enquiry carried out by two American physicians. The number of cases tested—264—was exactly the same, but whereas the tests here revealed 32 (12.13 per cent) positive, and 232 (87.87 per cent) negative between the 24th and 26th day, the American observers found only 11 (4.2 per cent) positive, and 253 (95.8 per cent) negative, the day of test being 25.8.

POLIOMYELITIS AND CEREBRO-SPINAL FEVER

The note on acute poliomyelitis, which is by Dr. J. D. Rolleston (brother of Sir Humphry Rolleston, formerly Regius Professor of Physic, Cambridge and a past president of the Royal College of Physicians) deals with 156 cases admitted to the hospitals between 1st September, 1927, and 31st December, 1935. Only in 104 was the diagnosis of poliomyelitis confirmed, which suggests that London, at any rate, escaped very lightly and was fortunate so far as this disease was concerned. Dr. Rolleston analyses the cases very closely, indicating the parts affected, the treatment adopted, and the final results. As is commonly the case, in the majority of cases the legs were the parts attacked, the diaphragm being involved in 4 cases only. Deaths numbered 4. So far as treatment is concerned, in the cases in which convalescent serum was given, no demonstrable benefit resulted. A Drinker apparatus installed in 1935 was used in 3 cases of acute poliomyelitis with diaphragmatic paralysis; 2 recovered and 1 died. In the report on cerebro-spinal fever, the question of serum treatment is discussed. Of the 25 cases regarded as amenable to this form of treatment and given various types of serum, 16 recovered and 9 died.

TUBERCULOSIS IN LONDON

Of papers on tuberculosis there are 5. In one of these there is a description of the development of the scheme for dealing with this disease in London, and more particularly, the provision made by the London County Council for the treatment of pulmonary cases in sanatoria and hospitals, and for linking up the various agencies engaged in tuberculosis work in the Metropolis, so that each and all may operate at their greatest efficiency. Broadly speaking, in London the County Council is responsible for providing institutional treatment in sanatoria and hospitals of their own or in private establishments. The Borough Councils have the duty imposed upon them of making provision of dispensaries and carrying out domiciliary treatment and preventive measures locally. Other noteworthy contributions on tuberculosis have reference to treatment, the chief medical superintendent of this service, writing on the present position of the treatment of pulmonary tuberculosis and praising the work done at village settlements, such as Papworth, and colonies such as Preston Hall. Included also are notes on recent ad-

vances in the surgical treatment of pulmonary tuberculosis, and of treatment for tuberculosis of the larynx. That the writer of the communication on the latter finds himself able to speak most hopefully with regard to the progress made and to anticipate even greater advances in the future, is most heartening.

VENEREAL DISEASE IN WOMEN AND CHILDREN

In relation to the venereal diseases (and mention of these gives me an opportunity of noting that, thanks to the efforts of those who publish reviews of news, the man in the street here has almost as full a grasp of Dr. Parran's ideas and plans as his opposite number in the United States), there are two communications worthy of attention. One has reference to activities at a special hospital provided for the treatment of venereal diseases in women (almost the most necessary and the most pathetic of all the institutions), the other being a report on the work done at a congenital syphilis unit situated at one of the general hospitals of the Council. In the hospital for women there are two blocks, in one of which there are 50 beds and 4 cots, and in the other, the maternity block, 30 beds with 2 labour beds and 16 cots. The admissions to the hospital during 1935 were the highest in any year since 1920—adults, 369, and infants, 18. Of the 369 women, 228 were suffering from gonorrhoea, 57 from syphilis, and 72 from both. The age of the patients varies from 16 to the middle 40's. They come from all classes, but are mainly working girls, and street girls, some being married women. Many of them are difficult to deal with: they are "childish in many ways; they are hypersensitive and easily upset by trifles; and often they may even be on the look-out for some reason to grumble." Nursing is not easy. It is noted that, in addition to training generally and in the special technique of treatment, "the successful nurse must be able to practise a high degree of reticence, strict impartiality (a gossiper cannot retain the respect of these girls), and control of temper under the most trying circumstances." Very much of this note contains reference to administrative matters, what is said upon occupational therapy, and the difficulties associated with providing employment and entertainment for the patients as the patients' health improves, being particularly useful. The congenital syphilis unit has only been running properly since May, 1934, and only a comparatively small number of cases has been dealt with. In these, the best results have been obtained in cases brought early, the reporter expressing regret that so few of the admissions are of infants under 2 or 3 months. Even more strongly he regrets that it does not seem to be sufficiently widely grasped that the very best results, so far as the babies are concerned, would be obtained by the appropriate treatment of the syphilis in their mothers as early as possible in the pregnancy.

RADIUM IN UTERINE CANCER

Other special units reported upon at which valuable work is being done, are those at which puerperal fever is dealt with; that at which radium treatment for carcinoma of the uterus is undertaken, and those for such conditions as goitre, diabetes, and arthritis. The note from the Radium Center is by Sir Comyns Berkeley, Chairman of the Central Midwives Board. The note throughout—as any who know Sir Comyns would expect—is one of optimism, slightly tinged with caution though it be. Generally, his promise is that the results of treatment will be

excellent if it is begun early enough, and not without hope, even though the stage be a little late. That there is need for much more propaganda than is now undertaken he is convinced, and he longs to see more post-natal centres established, and more leaflets distributed amongst the women attending them, giving information about the monthly periods, and stressing the great importance of consulting a doctor about any irregularity. The need for internal examination he stresses also, and points out that in his view "the three disgraces associated with cancer of the uterus are: Delay—Fear—Ignorance." A very impressive paper this, and one from which I should like to make many more quotations. As a fact, there are many papers in the report that contain matter worth quoting if space permitted any more than merely a note to this effect, and a word commending the report to the consideration of colleagues in the health service in the United States. A word here of commendation to those who produced the report, and arranged for and allowed its publication, may perhaps be permitted also. CHARLES PORTER, M.D.

PUBLIC HEALTH EDUCATION*

Health Education in U. S. Public Health Service — In *The Health Officer* (May, 1937) Dr. R. R. Spencer reports on "Health Education Activities of the U. S. Public Health Service":

The United States Public Health Service has perhaps never taken full advantage of its opportunities to disseminate authoritative health information. However, about a year ago an Office of Public Health Education was established in the Division of Scientific Research on a very modest scale with an annual appropriation of only $6,000. Later this office was transferred to the Division of Sanitary Reports and Statistics.

To this latter division has fallen the lot, heretofore, of handling the greater part of all publicity, press relations, and the answering of numerous questions that come to the Service unsolicited from the general public. In addition it has prepared over a period of some years, moving picture films, special exhibits, posters, pamphlets, and radio-health talks for the public. These activities have served a very useful purpose but lack of funds and personnel have prevented further expansion. At the same time, other divisions of the Service, such as the Division of Venereal Diseases, have as a rule independently conducted their own educational campaigns, as the need arose, and as funds were available. Indeed, education is of necessity an integral part of all Service activities.

Nevertheless, up to the present time our efforts in health education have been rather desultory and sporadic. No clear-cut policy has yet been formulated. In fact, we have considered the activities of the Office of Health Education during the past year as purely experimental. So far we have ventured into 3 distinct fields:

First, the collecting and organizing of pertinent health information from 75 monthly or weekly periodicals and a dozen or more public documents and annual reports. As far as we are aware no one has systematically collected the vast uncoördinated mass of source material published by foundations, by national, state, and municipal agencies, annual reports of hospitals, government bureaus, and other bulletins covering the general field of health and human welfare.

Already we have found this material unusually valuable, and as time goes on the accumulated data will grow in value. Upon request it is passed out to officers of the Service who wish to prepare papers, to other government bureaus and independent establishments which desire bibliographies in the various health fields and to private citizens and business firms who request specific health information. . . .

We believe our office has created a situation in which health and welfare agencies will always look to us for authoritative health information and as a clearing-house in matters of health education.

Our Second experiment has been the publication of a monthly bulletin, *The Health Officer*. Its circulation is limited to state, municipal, district, and county health officers and members of their staffs, commissioned officers of the Public Health Service, departments of hygiene and preventive medicine in medical schools, and to certain welfare agencies.

Although no efforts have been made to increase its circulation, the mailing list has doubled within the first year. *The Health Officer* is largely a publication by and for health officers, and its purpose is to keep the public health personnel throughout the country abreast of the times and to serve as a unifying medium of exchange. Highly technical articles are not acceptable, but our aim is rather to give newsy and useful health facts presented in a semi-popular and entertaining style. . . .

At the present time, only 3 states, Alabama, New York, and Mississippi, have asked that *The Health Officer* be sent to all of their county or district health departments, thus taking full advantage of this publication. Upon request, any health unit will be placed on our mailing list, within the limits of our allotted circulation, which at present is only 2,000 copies. Our circula-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

tion, however, can be increased as the need arises, with the approval of the Surgeon General.

We have been compelled to turn down applications for copies from private physicians. If we honored all requests or solicited subscriptions, our circulation could be easily quadrupled. . . .

Our third venture has been an expansion of the training given our own young commissioned officers. Since the inception of our office in March, 1936, two classes of officers have received training. Believing that such training has now become an essential part in the development of the Service and because of the expanding duties and obligations of a Public Health Service Officer, this course now covers a period of about 9 months. . . .

Plans for the future. At the request of the Surgeon General, Assistant Surgeon General C. E. Waller appointed a committee to study our health education activities and to submit recommendations as to just what rôle the Service should play in this field. The committee consists of Surgeon Estella Ford Warner, Senior Surgeon R. R. Spencer, and Senior Public Health Statistician Mayhew Derryberry. The committee has now submitted a brief memorandum to the Surgeon General to the effect that the general health educational work of the Service be continued under the supervision of the present committee which will make progress reports from time to time. Under this tentative agreement, it was suggested that Dr. Warner serve as liaison officer between the Service and the states as adviser in the formulation of plans in health education; that Dr. Derryberry make studies in educational methods and the evaluation of the effectiveness of such methods; and that Dr. Spencer continue the publication of *The Health Officer,* the collecting and organizing of health information, and the supervision of the instruction given the classes of commissioned officers.

Surely all state and local health departments should receive *The Health Officer.* We suggest that urgent requests for a place on the mailing list be addressed to Surgeon General Parran.

Furthermore, since the health departments and private health agencies should be working in close harmony and in active coöperation, the full values of *The Health Officer* will be secured only when the private agencies are admitted to that mailing list.

In the May, 1937, issue will be found other material on health education.

"The Health Officer's English" is an editorial on an ever timely subject.

"Misinformation for the Public" presents the *Coronet* (March, 1937) worse than silly article on cancer.

Dr. Estella F. Warner presents "Some Observations Concerning Health Education Programs in State Health Departments." Most significant seems to be the lack of "programs" and the widespread lack of discrimination in the selection of materials for adult health education.

"The Detective of Science" is a 15 minute radio drama "based on an actual typhoid outbreak" in 1931.

Under "Abstracts and Annotations" see "Proposed Program for the Education of Women in Regard to Venereal Disease" (Paris).

"News Briefs" tells about a series of Sunday magazine feature articles on the National Institute of Health; newspaper editorial comment on needless diphtheria deaths; radio discussions of syphilis and gonorrhea in Oklahoma City; and "Science and Modern Medicine," a talking film used in a local syphilis campaign in Greensboro, N. C.

Hygeia, June, 1937—*Hygeia,* 535 N. Dearborn St., Chicago, Ill., for June, 1937 (*25 cents*) offers the following:

The doctors assemble (significance of medical conventions) . . . Nursing waterlogged America (Red Cross flood service) . . . Health notes for the woman of forty . . . Gonorrhea (enlightened public consciousness and coöperation) . . . Eyeglass mirrors of the era (styles, superstitions, foibles) . . . The evolution of spectacles (pictures and text) . . . Hot weather hazards . . . Vacation don'ts for children . . . Shall our child go to a summer camp? . . . Medical aspects in Apicius ("who lived to eat under Tiberius") . . . Medicine in the 17th century (pictures) . . . Office hours (a play) . . . The contrast in a hundred years . . . Nature's G-men (skunks and other animals)

. . . The laboratory guinea-pig . . . Schistosomiases . . . The doctor in England . . . On walking into the hospital with malaria (why go to a hospital) . . . Questions and answers . . . New books on health.

In "School and Health":

Why adolescents go wrong . . . Teacher and nurse coöperate in a guidance program . . . Looking forward to the vacation (safety) . . . A usable health record device for schools (Grotiot, Ohio) . . . Injecting interest into health lessons (Bovina Center, N. Y.).

1937 Awards—Annually the Social Work Publicity Council makes awards for "distinguished interpretation" in the fields of health and social welfare.

In its *News Bulletin* (May, 1937) citations are offered on three projects in health.

To the Onondaga Medical Society, Syracuse, N. Y., for a maternal welfare campaign.

To the United Hospital Fund of New York for "80% of the People," a money raising campaign pamphlet.

To Henry Street Visiting Nurse Service, New York, N. Y., for a money raising campaign booklet.

National Education Association—At Denver meeting of the National Education Association in June, 1937, the American Physical Education Association, if all went according to plan, was merged with the present Department of School Health and Physical Education under the name of the American Association of Health and Physical Education, a Department of the National Education Association. The organization of a Division of Health in this new department offers an opportunity for all who are concerned with or interested in any type of school health activities to participate actively in the plans for and in the development of this reorganized department of the National Education Association.

The advance notice of the meeting stated that films, prepared radio talks, and other classroom aids for teaching health would be exhibited.

Inquiries about the new division may be addressed to Anne Whitney, School Health Education Service, National Education Association, 1201 16th St. N. W., Washington, D. C.

Health Education in England—A national health campaign intended to "publicise the health services of local authorities and to encourage the use of such services" will continue in England from October, 1937, through March, 1938, is announced in *Public Health*, official publication of the Society of the Medical Officers of Health.

The Society long ago pointed out that the best results could not be obtained from public health schemes without securing the understanding coöperation of the public. The object of the proposed campaign is to see that the health services already provided by local authorities are used to capacity. The campaign will be directed from the Ministry of Health, and the principal cost (including that for such printed materials as posters and leaflets) will be borne by His Majesty's Government.

Home Demonstration Against Pneumonia—As reported in *Health News* (State Department of Health, Albany, N. Y. May 3, 1937):

A committee of home demonstration agents representing 50 counties of the state has voted to undertake, as far as facilities permit, the inclusion of pneumonia control education in their plans for the coming year.

This action followed the recent annual meeting of home demonstration agents at the College of Home Economics, Cornell University, Ithaca, when Odessa Dow, agent for Franklin County, read a report of the experimental educational program on pneumonia control conducted in that county during the past winter under the auspices of the Home Bureau. The success of the program, the interest it aroused, and the means it provided for reaching a large group of responsible women with selected and well balanced information resulted in the appointment of a special committee to consider the further development of this work. . . .

Recommendations were adopted and sent out to home demonstration agents in 50 counties where home bureau work is organized for a total of 25,000 women, most of whom live in rural communities. In the interest of efficient and unified effort, the closest possible coöperation with county medical societies as well as with district or county health officers was advised in the development of plans.

The above is an example of wholesale coöperation awaiting cultivation by the alert, and informed state health agency.

Making Use of Libraries—The library is one of the less developed channels for spreading health information. A volunteer committee may be the chief medium for developing the library field—public, school, lending, club, and other special libraries.

For some aspects of library coöperation see "Libraries and Tuberculosis," by I. L. Towner, in *Bulletin*, National Tuberculosis Association, 50 W. 50th St., New York, N. Y. May, 1937.

Helped by the depression, the public library has discovered that it is not merely a place to dispense books, fiction and non-fiction, but also one of the main institutions for adult education. The pamphlet file, containing as it does the latest information on various subjects of timely interest, has come into its own, so the associations that have pamphlet literature to distribute will do well to get in touch with the public librarians in the neighborhood which they serve. There, in the majority of cases, willing collaborators will be found, who by means of bulletin boards, exhibits in windows and cases, and other forms of library publicity will help to bring the news about tuberculosis to the attention of the people by whom it is needed and for whom the pamphlets have been prepared. The city and town libraries are not the only ones that can be helpful. County libraries by means of traveling libraries, in packages or in bookmobiles, carry to remote rural areas books and pamphlets for the use of those who otherwise would have little access to publications of any kind.

The state libraries are also interested in library extension work and many of them also have traveling libraries. In the states in which the state libraries may not be active there are library commissions which are always interested in any promotional work. Two of these that have given especially good service are in New Jersey and Louisiana but there are many others. In some cases the library of the state department of health or the state department of education will be glad to receive pamphlet literature for use with the public.

Not only in the public library but also in the school libraries coöperation may be found. With the new plans in education, the project method, the unit plan and other progressive procedures the library has in many places become the very heart of the school. Even where such activities are not carried on the school library plays a very important part in the school day. Many will remember a school library as either a dusty collection of dog-eared books in a dark corner of the room or a place where the older pupils were allowed to study, supposedly away from the distraction of the study hall, but more often as a place where notes could be passed and conversation indulged in. All that is changed now and in the school library, presided over by a competent and well trained teacher-librarian, may be found up-to-date material for the use of pupils in the units or projects that are being worked out in class.

Health Education in Journal for May, 1937—Of interest to health educators in *American Journal of Public Health:*

In "Obstacles and Aids to Communicable Disease Nursing," by Haupt, is a paragraph (page 436) on the educational functions of the nurse; a day's work, much of it educational (page 436); and one of five aids in saving many lives (page 438):

Better understanding of the whole service of public health nursing in this field on the part of physicians, health officers, school personnel, industries, and the lay public.

"Recent progress in Health Education," by Shepard (page 454), something for all to read.

"Appraising the Educational Content of a Health Service Program," by Palmer and Derryberry (page 476), is for all who have to do with schools.

"Tests and Promotion of Registration of Births and Deaths," by Deacon (page 494), explains how publicity is badly timed if it is put on when registration is being checked for accuracy.

In "The Use of Lay Boards by Official Health Agencies," by Peterson, find description of functions of such bodies in a nursing agency (page 500):

> The third function of the committee is to interpret the service to the community and guide the nurse in developing that service. This, of course, does not mean that a lay committee advises regarding nursing technic, rather, they help decide how to make most effective for their community a program in conformity with well established practices in the field of public health.

In "Books and Reports" see review (page 533) of "Annual Report of the Surgeon General," a volume for all public health workers who can get hold of a copy.

And be sure to read the review (page 534) of "Get It Right!"

Health Conservation Contest awards are listed on page 542.

Summer school courses in public health are announced on pages 546–550.

WANTED

If you can answer this one please write to Adele E. Yoé, Department of Public Health, Louisville, Ky.:

> Do you have any bulletin or pamphlet about health education or industrial hygiene?

If you can tell of any health plays for adults please tell Dr. C. F. Bolduan, Department of Health, New York, N. Y.

BOOKS RECEIVED

HOW THE PRESIDENT, THOMAS JEFFERSON, AND DOCTOR BENJAMIN WATERHOUSE ESTABLISHED VACCINATION AS A PUBLIC HEALTH PROCEDURE. By Robert H. Halsey. New York: Published by the Author, 1936. 58 pp. Price, $1.00.

TEN MILLION AMERICANS HAVE IT! By S. William Becker. Philadelphia: Lippincott, 1937. 220 pp. Price, $1.35.

THE CONTROL OF BOVINE TUBERCULOSIS IN MAN. By Nathan Raw. London: Bailliere, Tindall & Cox, 1937. 128 pp. Price, $2.00.

PUBLIC WORKS ENGINEERS' YEARBOOK, 1937. Proceedings of American Society of Municipal Engineers International Association of Public Works Officials, Toronto, Can., Sept. 28–30, Oct. 1, 1936. Chicago: American Public Works Association, 1937. 283 pp.

MAN IN A CHEMICAL WORLD. By A. Cressy Morrison. New York: Scribner, 1937. 292 pp. Price, $3.00.

THE MENTALLY ILL IN AMERICA: A HISTORY OF THEIR CARE AND TREATMENT FROM COLONIAL TIMES. By Albert Deutsch. Garden City: Doubleday, 1937. 530 pp. Price, $3.00.

GETTING READY TO BE A MOTHER. By Carolyn Conant Van Blarcom. 3d ed. New York: Macmillan, 1937. 305 pp. Price, $2.00.

PSYCHIATRIC SOCIAL SERVICE IN A CHILDREN'S HOSPITAL. By Ruth M. Gartland. Chicago: University of Chicago Press, 1937. 105 pp. Price, $1.25.

PHYSICIANS AND MEDICAL CARE. By Esther Lucile Brown. New York: Russell Sage Foundation, 1937. 202 pp. Price, $.75.

YOUTH SERVING ORGANIZATIONS. National Non-Governmental Associations. By M. M. Chambers. Washington: The American Council on Education, 1937. 327 pp.

FLUORINE INTOXICATION: A CLINICAL-HYGIENIC STUDY (With a Review of the Literature and Some Experimental Investigations). By Kaj Roholm. London: Lewis, 1937. 364 pp.

TECHNIQUE OF UNDERWATER GYMNASTICS. By Charles Leroy Lowman. Los Angeles: American Publications, Inc., 1937. 276 pp. Price, $5.00.

MANUAL OF PUBLIC HEALTH BACTERIOLOGY. Issued under direction of the Department of Public Health, San Francisco, Calif.—Dr. J. C. Geiger, Director. San Francisco: Stacey, 1937. 141 pp. Price, $1.50.

MATERNAL CARE. By Dr. Fred L. Adair, Editor. Chicago: University of Chicago, 1937. 93 pp. Price, cloth, $1.00, paper, $.25.

BOOKS AND REPORTS

A Woman Surgeon—*By Rosalie Slaughter Morton. New York: Stokes,* 1937. 399 pp. Price, $3.00.

It is given to few men and to still fewer women to lead a life of such adventure and service as is recorded in this autobiography. One involuntarily looks for the source of the stamina and determination which led this young girl to break with her traditions to such an extent as to study medicine and to follow her profession in various parts of the world with such amazing success as to win high honors, no less than eight decorations for distinguished service having been bestowed upon her. We find the key to her character on both sides. On her Father's side, since 1620, when her ancestors settled in Virginia, 17 direct and 52 collateral descendants have studied medicine. The Mother was a Quaker, of Mount Holly, N. J., a sect noted for its steadfastness and humanity and to which we owe such men, among others, as Lord Lister, Lettson, and Hodgkins.

Dr. Morton (then Rosalie Slaughter) graduated from the Woman's College of Philadelphia, founded in 1850 by two Quakers, which remains today the only medical school in this country exclusively for women. Postgraduate work in Berlin, Vienna, Paris, and London came after she had had some experience in practice, chiefly in dispensary work. In running over the Table of Contents we see that in India she was in the midst of an outbreak of bubonic plague; that she worked in Greenland under Dr. Grenfell; that she served abroad during the World War; was on the Salonica front and with the French Fleet of Mercy. Indeed, there are few countries of the world which she did not visit during or soon after the war. After such a busy life she is now to be found practising medicine in Winter Park, Fla.

The book must be read to be appreciated as no review can do it justice. Dr. Morton has not given her entire attention to activity. In almost every page she gives evidences of rational thinking and of having reached conclusions drawn from an eventful life. Her life story will be an inspiration to all interested in humanity and especially to the women who are now playing so large a part in our medical world.

The reviewer has had the pleasure and honor of knowing Dr. Morton for many years, an acquaintance which began during her early struggles in Philadelphia which she so graphically describes. He begs to offer her sincere congratulations on her accomplishments and to wish for her many additional years of usefulness and happiness.

MAZŸCK P. RAVENEL

Modern Principles of Ventilation and Heating—*By T. Bedford, D.Sc., Ph.D. London: H. K. Lewis & Co., Ltd.,* 1937. 85 pp. Price, $1.75.

The author has assembled 3 of his lectures given at the London School of Hygiene and Tropical Medicine under the Heath Clark Bequest to the National Institute of Industrial Psychology. Recognizing that the worker's attitude toward his job is affected by his environment it is obvious that the psychologist, physiologist, and engineer meet on common ground. Each

is intimately concerned with the problems of heating and ventilation.

Basic principles of the whole rather than technical details are discussed. Much of the research work described was done by the author and his colleagues in the Industrial Health Research Board, although recognition is given to others. The volume is of special concern to public health officers and all others interested in the subject.

The contents comprise 8 chapters: A brief historical account of heating and ventilation, modern methods, a discussion of warmth and comfort, the causes of discomfort, stimulating environments, work at high temperatures, and the influence of atmospheric conditions on accident frequency and sickness. A bibliography and index accompany.

This work by an outstanding authority will undoubtedly have a wide reception in this country and on the Continent. Its brevity of statement, yet comprehensive coverage, commend it especially to the busy reader.

EMERY R. HAYHURST

Rural Health Practice—*By Harry S. Mustard, M.D. New York: The Commonwealth Fund,* 1936. 620 pp. Price, $4.00.

Rural Health Practice is a fitting sequel to *Introduction to Public Health.* The latter was an analysis of public health problems in skeletal outline form. *Rural Health Practice* clothes the skeleton with form and symmetry. The reader having his problem clearly defined, is shown the practical ways and means of rounding out and conducting his program in such a way as to endow it with common sense and humanity rendering it closely akin to an organic personality.

I have used the word "sequel" knowing that this word is applied most commonly to novels or continued stories. *Rural Health Practice* is not only a continuation of the thought contained in *Introduction to Public Health,* but it is written in such a charming style as to be readable in the same sense as a novel. It is characterized by clear expression, familiar diction, and an easy style seasoned with wit and good humor, so that from start to finish there is not a dull moment.

The book has been written by one who knows in a very intimate way the everyday problems of the rural health worker. It is not a bookish adaptation of city health practice to rural conditions. Stereotyped theory and dogma are conspicuous for their absence. Candid treatment of the practical problems of rural health work from the standpoint of personal experience, and common sense exposure of rural health fallacies, flash from every page.

The author is clever in his handling of controversial issues and usually careful to refrain from a partisan position. His method is to present all sides of a question, leaving the reader to draw his own conclusions.

Every chapter makes an essential contribution so that it is difficult to commend one more than another. Certain items merit special commendation, as the chapter having to do with the internal organization of state health departments, and particularly that function concerned with the supervision of local health service. The author advises against the very common tendency to the creation of a multiplicity of bureaus, and suggests a logical and workable plan of organization. His discussion of the supervision of local health work is of monumental importance. It is only by adherence to the principles emphasized that complete harmony and the highest efficiency can be secured. Not

only every state health officer who has to do with the supervision of local health work, but every bureau chief should saturate his very soul with the policies and plans stressed in this connection. This chapter alone is well worth the price of the book.

The second item which stands out pertains to the internal management of the local health program and is discussed under allocation of program time, and sequence in development of the program. These titles, put into a single term, signify relative values. A sense of relative values is essential to the orientation and orderly development of any program, and determines the strategy that must be employed in carrying out a program with limited forces, a situation with which practically every health administrator has to deal. In certain public health circles there has been observed a deplorable tendency to flout the balanced public health program. Occasions arise wherein it is wise to emphasize some certain objective out of proportion to others for the time being, but this should not discount the fundamental importance of proper weighting of the various activities with corresponding emphasis upon each problem.

This review is not meant as an unqualified eulogy. Not a few of the author's views and conclusions are debatable; some with which I personally frankly disagree. There are certain deficiencies to be noted, especially in the field of sanitation. Nothing is said on the subject of mosquito control, fly control, rodent control, food sanitation, and certain other sanitary measures that may be concerned with the protection of rural health. The book as a whole, however, is so overwhelmingly sound, sensible, practical, and reliable that any thought of criticism fades into insignificance. My general reaction can be summed up in no more expressive term than to say that it should occupy the same position with respect to the student and practitioner of rural health as does Osler's *Practice of Medicine* to the medical student and practicing physician. K. E. MILLER

Water Purification Control—*By Edward S. Hopkins. (2d ed.). Baltimore: Williams & Wilkins,* 1936. 184 pp. Price, $1.75.

The principles of water purification, for the purpose of guiding the water works operator in the successful control of his plant, appears to be the aim of this book.

Each process employed in present water purification practice is considered in a separate chapter: coagulation, sedimentation, filtration, disinfection, taste and odor control, etc. Numerous operating difficulties that have been encountered in all of these, whether used alone or in various combinations, are mentioned. With a precision and simplicity of terminology, definite suggestions for successfully overcoming these problems are given. The value of these suggestions is strengthened by references to specific cases. This edition also contains a chapter explaining modern water softening methods.

While technical explanations and chemical formulae have been omitted, the excellence of the choice of references to current literature is such that a conscientious water works operator will find this volume a valuable book of reference. F. J. MAIER

Annual Report, Division of Public Health, Idaho, 1936. *Boise, Idaho.* 72 pp., mimeographed.

This report marks the first year of a full-time state health organization and therefore is a milestone in the public health progress of the State of Idaho. Public health administrators will recognize a commendable record of progress

in this short space of time in the development of a central program of supervision and technical assistance coupled with the formation of 4 whole-time county health units and of 7 additional county organizations provided with minimum whole-time nursing service. The Public Health Adviser, upon assuming office as full-time director of health services, in December, 1935, derived benefit in the initial planning of the new program from a health survey made three years previously by a Surgeon of the U. S. Public Health Service. State and local funds were supplemented by grants-in-aid made possible by the Social Security Act, and by the Rockefeller Foundation. Twenty-five persons received special training for a period of 3 months while 5 nurses, 3 physicians, and a sanitary officer attended schools of public health during the year.

Efforts have been made to stimulate the reporting of communicable diseases. With financial and technical assistance of the U. S. Public Health Service, a survey of the possible existence of bubonic plague in ground squirrels and other small animals was instituted. The presence of this infection was proved in sections of Eastern Idaho, and eradication measures were instituted in the infected areas through the coöperation of the U. S. Biological Survey and Works Progress Administration.

Since plague has been demonstrated during the past season in neighboring states, and because one human case developed in an adjoining state where the existence of plague had heretofore been unknown, and as a further spread of this infection is a great hazard to human life and more difficult of control when widely scattered, intensive efforts will continue to be made to locate foci of infection and carry on eradication measures.

Among the public health education activities are noted the preparation of a monthly bulletin distributed to physicians, schools, organizations, and individuals numbering 4,000 each month. Special lecture courses have been given in preventive medicine for the benefit of practising physicians, and educational activities have been promoted in dental health, in care of crippled children, and maternity and child hygiene.

IRA V. HISCOCK

The Joy Family—Malden Health Series—*By C. E. Turner, Dr.P.H., Alice L. Beckwith, Nell Josephine Morgan, R.N. (ill.) Boston: Heath,* 1936. 130 pp. Price, $.58.

The authors have planned a reader to serve as the basis for developing a health project in the classroom and it has been written on the second grade reading vocabulary level. The book, generously illustrated in color and also in black and white, offers many pleasant stories of adventures and everyday experiences in the life of the Joy children. Little second graders will like it.

ANNA B. TOWSE

Roads to Health and Happiness—*By Oscar C. Mueller. New York: Prentice-Hall,* 1936. 137 pp. Price, $2.00.

The author, a lawyer, has attempted to produce a brief health text for laymen. While interestingly written, its short paragraphs make sustained attention difficult. Some of the statements made are not in accordance with the facts. It presents the case for the moderate use of alcohol in a more favorable light than modern physiological research seems to justify.

CHARLES H. KEENE

Guide Book for Mothers—*By Allan Roy Dafoe, O.B.E., M.D. New York: Julian Messner, Inc.,* 1936. 256 pp. Price, $1.50.

To anyone who has had the privilege of personally seeing the Dionne quintuplets this book will come as a wel-

comed volume in child care. It will appeal to mothers—and even fathers—everywhere as coming from the doctor who has had most intimate knowledge of the rearing of these remarkable children. Dr. Dafoe gives due credit to the distinguished specialists whose scientific work contributed largely to the saving of the 5 babies' lives in the early months. His own skill, however, and the common sense and ingenuity used daily in the application of modern pediatric methods stand out in simple, direct statements on every page. Dr. Dafoe begins at the beginning, stressing the importance of prenatal care. He follows step by step the detailed procedures necessary to keep a baby well and to assure normal growth and development. A very timely and instructive chapter on safeguards for the premature infant is included.

The book is written in a delightful, personal style and is replete with practical suggestions. His "creed for mothers and fathers" should be framed in every home. We may not agree with the author in the size of families he recommends but mothers cannot help but profit by the practical advice and directions given. The publishers have certainly put out the book in very attractive covers and format.

RICHARD A. BOLT

Ortshygiene: Wasserversorgung, Abwässerbeseitigung, Beseitigung der festen Abfallstoffe, Wohnungs- und Siedlungswesen—*By Hans Lehmann; "Bäder und Kurorte"—By H. Vogt. Vol. 6 of Series "Gütt und Moebius: Handbücherei für den Öffentlichen Gesundheitsdienst." Berlin: Carl Heymanns Verlag,* 1936. 247 pp. Price, Marks 13.

The authors of this 6th volume of an extensive treatise on public hygiene, edited by Gütt and Moebius, are the directors, respectively, of the official bureaus dealing, in the one case, with water supplies, sewage disposal, industrial wastes, dwellings, and sites, and in the other, with public establishments affording medicinal baths and waters. The book, therefore, is the source for the latest information on German regulations and practice in these basic fields of public health.

The subjects treated by Lehmann include the origins, sources, procurement, and qualifications as to hardness, iron and manganese content, and corrosive potentialities of waters for potable and industrial uses. Another section deals with the physical, physiological, chemical, bacteriological, and biological examination of water. This treatment is well rounded out in all fields with two exceptions. In the directions for water sampling, insufficient recognition is given to the effect, especially in reservoirs, of the biological factors which differ in their incidence with the location, level, time of day, season, and age of the sample. The necessity of taking a complete vertical sample thoroughly mixed before the withdrawal of the smaller sample for analysis is not indicated. In the second place, the significance of the biological aspects and the place of supply of bath water and of sewage disposal are not so adequately apprehended nor presented as are the chemical. The chlorine treatment for destruction of bacteria in water supplies is the only one discussed.

The section on sewage disposal deals with various mechanical and biological methods of ridding sewage of its offensive load and with the special problems peculiar to various types of industrial wastes. Other sections are concerned with garbage disposal and with regulations concerning adequate protection of health in dwellings with reference to moisture, heating, lighting, ventilation, room size, and sanitary equipment.

Vogt's section is devoted to the medical and sanitary aspects of the supervision and regulation of public and private establishments, which utilize the natural resources of thermal and mineral springs, high altitudes, etc., for sanatoria providing curative and preventive medical treatment.

CHARLES A. KOFOID

Occupational Hazards and the Painter—*By Adolph B. Gersh. New York: District Council No. 9, B. of P. D. & P. of A.* (253 W. 28th St.), 1937. Paper, 99 pp. Price, $.54.

This bulletin, from labor's source, is written with special reference to New York, the author being director of the Extension Division of the Building and Allied Trades Compensation Service Bureau, and a member of the Compensation Committee, New York State Federation of Labor. There is a foreword by Louis Weinstock, secretary-treasurer of the local painters' union concerned, which has been seriously attempting to determine and eliminate industrial hazards.

The study presents a picture of the major hazards in the trade, relates this to the prevailing conditions and methods of work, and indicates some of the compensation problems. It is chiefly a result of an analysis of the compensation files of 646 injured painters, based upon a history of each case and the official reports of the New York Labor Department. Of these cases, 505 were closed and 141 open, as regards compensation. Most of the data are based upon the closed cases.

There are 5 chapters: The Evolution of the Painting Trade (5 pp.), The Causes of Accidents (15 pp.), Occupational Diseases (27 pp.), The Cost of Industrial Hazards (21 pp.), and Administrative Problems (22 pp.). There is no index but the Table of Contents is competently sub-headed. There are 21 figures and charts and 3 administrative forms. Under "Occupational Diseases" are cited, and sometimes abstracted, a number of studies made for this trade in more or less recent years, particularly in reference to accident statistics and poisoning. The causes of death among painters, as statistically determined by the National Tuberculosis Association (June, 1934), are emphasized, also hazards of the paint spray machine, and considerable space is devoted to studies made by the National Safety Council (Dr. Henry F. Smyth) in 1927. There is a sharp contrast between the more or less favorable conditions under which the painter may work in a factory and the widely varying conditions in the building trade.

While there are some typographical errors, and the author notes the usual shortage of certain essential data, this is an interesting study of the compensation experiences of a large local union and the economic and social significance thereof.

Not more than half a dozen health studies from labor sources have appeared in this country, and it would appear that here is a wide field for labor to "get busy" upon.

EMERY R. HAYHURST

Laboratory Outline in Filterable Viruses—*By Roscoe R. Hyde, Ph.D., with the Assistance of Raymond E. Gardner, Sc.D. New York: MacMillan,* 1937. 85 pp. Price, $1.50.

In their small volume the authors have presented brief directions "planned to give the student a first-hand knowledge of the *nature* and *behavior* of a number of representative viruses . . ." and "a more comprehensive experience with the *pathology* of a selected group of virus diseases ranging from necrosis to hyperplasia." The text has been evolved from labora-

tory notes used for a number of years in the teaching of courses at the School of Hygiene and Public Health, the Johns Hopkins University, where the late Charles E. Simon established the first university department on filterable viruses in the United States.

The exercises are designed as an introduction to the study of the filterable viruses. In preparing them, the choice of viruses and methods has been governed by questions of suitability for class use. They are planned with the idea that the work can be completed within the time allocated for the laboratory period. The directions are stated briefly. It follows that the student will require frequent consultation with an instructor to supply technical details. To make intelligent use of the exercises, the student must have been well grounded in general science, and must have received adequate training in bacteriology, immunology, and pathology. Thus, the volume will be most serviceable to the teacher confronted with the problem of giving a small number of well prepared students a practical introduction to the filterable viruses. For the more advanced student and the research worker, the volume will not be very helpful.

A number of technical methods are described: filtration, the preparation and use of collodion membranes, electrophoresis, tissue culture, the making and staining of histological preparations, etc. The descriptions of these methods have been gathered from many sources for the convenience of the student. The viruses selected for study exemplify a number of types. They include the viruses of Bacteriophagy, Tobacco mosaic, Lymphocystic Disease of fish, Vaccinia and Variola, Fowl-pox, Herpes, Rabies, Rous Sarcoma, Poliomyelitis, and Yellow Fever. Selected references are given with a view to guiding the student to suitable reading material for use in connection with the laboratory work. This selection is rather arbitrary and inadequate.

GEORGE PACKER BERRY

Vitamins—In Theory and Practice—*By Leslie J. Harris* (2nd ed.) *New York: Macmillan,* 1937. 242 pp. Price, $3.00.

Directed toward science students, medical men, and others interested in the vitamin question, this second edition of a book reviewed in this *Journal* in April, 1936, presents with a minimum of academic uncertainty a summary of knowledge in this field, comprising an unexpectedly complete and up-to-date wealth of detail. In fact, one might be permitted to wonder whether the combination of positive assertions of theory with minimum reference to debatable questions is entirely compatible with the completeness of detail in regard to the varied phases of "vitaminics" which is displayed in this book.

To one somewhat conversant with progress in vitamin research this book is helpful in refreshing the memory; for one seeking the facts for the first time, it should be exceedingly instructive. For data on Anaemia in Aberdeen to Xerophthalmia in Africa, a very complete index facilitates the search for the facts about vitamins as interpreted by an author whose sources of information have been exceedingly comprehensive. Forty-four tables and 66 illustrations are interspersed through the well printed and attractively arranged text. JOHN W. M. BUNKER

Dietetics Simplified—*By L. Jean Bogert, and Mame T. Porter. New York: Macmillan,* 1937. 637 pp. Ill. Price, $3.00.

This is primarily a textbook for students in home economics and die-

tetics, but it will be useful to physicians and nurses. The intelligent lay public also can turn to this book with assurance that the information it contains is authentic, complete, and understandable. The young housewife who reads it seriously can find, so far as present knowledge permits, all the information that is necessary to make the most of the food resources at her disposal. The conventional chemistry and physiology of food and metabolism have been almost entirely omitted; so the book is what the title indicates, a treatise on dietetics. As would be expected the bibliography is limited.

The first section, 95 pages, is devoted to the elementary principles of nutrition, and includes chapters on energy, protein, minerals, vitamins, water, and fiber (bulk). The second section, 118 pages, discusses the normal diet, and includes chapters on menu building, diets for various members of the family and economic and racial factors. This section is eminently practical, and is sufficiently detailed to fit any common individual requirement. Specific menus are described with as definite a statement of quantities as is practicable. The author leans definitely toward the Sherman school of thought, in the allowances for milk, fruit, and meats. There is a detailed discussion of special requirements, due to age, sex, body conformation, and occupation. The choice of foods at different income levels is given careful consideration, always with the objective of insuring a diet that is entirely adequate.

The section on Diet Therapy covers over 240 pages and includes all except the rare and obscure diseases. Again the choice of food with abundant detail as to quantities, is discussed in the most specific manner. There are also two sections on laboratory instruction, one on Lessons in Cookery, over 80 pages, and one on Diet in Disease, over 120 pages. These three sections also impress the reviewer as a competent and reliable source of information, but he hesitates to be more specific since he is not trained in those fields.

There is an appendix with Nutritive Values of Foods, Weights and Measures, and Weight Tables. The book is carefully indexed. A. G. HOGAN

Baby Epicure—*By Elena Gildersleeve. New York: Dutton,* 1937. 141 pp. Price, $1.75.

Baby Epicure purports to be a book which will make every child "critical and particular about its food and capable of enjoying a sane and varied diet." This is indeed a worth while but rather large result to expect from so small a book of recipes. The recipes are very interesting, possessing all the international flavor that their author claims. The dishes are within the nutritional possibilities of the young epicure. The running comment between recipes intrigues the imagination and so accomplishes what a more thoroughly scientific recipe book might fail to do. It stimulates the cook to make the culinary effort which is required for the true food epicure.

VICTORIA K. BALL

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH.D.

General Mortality Rates Up—If present trends continue, the time will soon come, concludes this article, when 95 per cent of new-born infants will survive the first year of life. May that forecast prove correct.

ANON. Mortality in Certain States During 1936 With Comparative Data for Recent Years. Pub. Health Rep. 52, 19:587 (May 7), 1937.

Care of Sick in New York—Under the chairmanship of Dr. George E. Vincent a committee has been engaged for 2 years on a study of the "activities, investment, and financial operations of all institutions and agencies organized for the care of the sick in that area." Committee recommendations are summarized under these categories: hospitals, nursing service in hospitals, out-patient services, ambulance service, medical social service, care of the chronic sick, convalescent care, nursing the sick in their homes, organized home medical care, control and coördination of institutions, maternity care, mental diseases, tuberculosis, syphilis and gonorrhea, cancer, heart disease, dental care, diabetes. Copies of the full reports can be obtained from the United Hospital Fund, New York City. A short summary of the recommendations is given in two references.

ANON. Sixty Improvements in Hospital Care. Mod. Hosp. 48, 5:67 (May), 1937. (Editorial) The Hospital Survey for New York. Am. J. Nurs. 37, 5:507 (May), 1937.

Why Teeth Decay—Extensive research into the cause of dental caries leads the author to the belief that it is a specific bacterial disease caused by the organism *Lactobacillus acidophilus*. This organism acting on carbohydrates in contact with the teeth forms acids which dissolve the enamel and produce a cavity. This is the only factor having any high degree of correlation with the disease that has thus far been discovered. As yet only one successful method has been found for the control of the disease and that is the elimination of sugar from the diet. In groups of children so fed, dental caries was arrested in approximately 90 per cent of the individuals. Further measures for prevention and control that have proved advantageous to the children are reported.

BUNTING, R. W. The Prevention of Dental Caries. Michigan Pub. Health Bull. 25, 5:91 (May), 1937.

For Gonorrhea—One of the factors precluding effective control of gonorrhea has been the lack of a specific treatment. In this preliminary report the authors present their excellent results with the use of sulfanilamide at Johns Hopkins.

DEES, J. E. The Use of Sulfanilamide in Gonococcic Infections. J.A.M.A. 108, 22: 1855 (May 29), 1937.

Social Case Work and the Child—This series of articles dealing with the child will be of interest to those public health workers who turn to social agencies for coöperation and who wish a better understanding of the principles which underlie such work.

GARTLAND, R. The Child, The Parent, and the Agency

COLE, L. C. The Private Children's

Agency—Its Possibilities and Limitations

GREEN, R. The Inner Significance and Outward Expression of Children's Problems

HEARSEY, M. E. Problems of the Handicapped Child: As Met by the Medical Social Worker

The Family. 18, 3:75 (May), 1937.

About Tuberculous Infections—Among 18,000 college entrants, the tuberculin test was positive in from 40 to 60 per cent of the Eastern and Far Western States, and lower (from 20 to 30 per cent) in Central States. Rates were higher among men than women.

LONG, E. R., and SEIBERT, F. B. The Incidence of Tuberculous Infection in American College Students. J.A.M.A. 108, 21:1761 (May 22), 1937.

Diphtheria Carriers — After discussing thoroughly the difficulties encountered in detecting diphtheria carriers and methods for doing so, the paper comes to the sensible conclusion "to immunize the susceptible population and stop bothering about the carrier."

MITMAN, M. The Problem of the Diphtheria Carrier. J. State Med. 45, 5:249 (May), 1937.

Safer Though Less Pleasant Deliveries — Urging less obstetrical anesthesia and more obstetric care, this article points one objective for health education: to teach prospective mothers that safety in childbirth is more important than unconsciousness produced by drugs.

MONTGOMERY, T. L. Obstetric Amnesia, Analgesia, and Anesthesia. J.A.M.A. 108, 20:1679 (May 15), 1937.

Useful in Prognostication—Charts from the records of disease reports made to the U. S. Public Health Service show characteristic seasonal incidence. Diphtheria, influenza, measles, meningitis, smallpox, typhoid fever, poliomyelitis, and scarlet fever are presented.

OLESEN, R., and HAMPTON, B. C. Seasonal Patterns and Trends of Communicable Diseases. Pub. Health Rep. 52, 19:609 (May 7), 1937.

Posing the Problem of Chronic Disease—In a northern industrial city, 1 in every 5 persons canvassed had a chronic disease, a defect of vision or hearing, or a permanent physical impairment. Greatest numbers were found in the relief population and the aged. On the day of the canvass, 1 in 10 of the unemployed heads of families were idle because of disability. Like most cities, the one surveyed had no plan for the control of chronic disease, due no doubt to lack of factual information about the situation. The survey certainly provides a basis for lively community action.

PERROTT, G. St. J., and HOLLAND, D. F. Chronic Disease and Gross Impairments in a Northern Industrial Community. J.A.M.A. 108, 22:1876 (May 29), 1937.

Old Age Security for Professional Workers—Since the Social Security Act does not affect employees in philanthropic or educational institutions, most public health workers must cast about for other ways to care for their old age. Their attention is called to the fine type of service given by some institutions for both men and women, and to the need for planning well in advance if admission to such homes is to be secured.

RANDALL, O. A. Old-age Security at "Home." Am. J. Nurs. 37, 5:488 (May), 1937.

For Sick Babies—Cubicle isolation beds for infants are found safe, satisfactory, and practical. Wider use is urged.

SCHICK, B., and KARELITZ, S. Pirquet Cubicles for Infants. J.A.M.A. 108, 20:1684 (May 15), 1937.

The Nut on the Steering Wheel—Health officials who are asked to take

part in motor car accident prevention campaigns would do well to read this article which emphasizes the limitations of the driver testing apparatus which currently receives so much newspaper publicity.

SELLING, L. D. The Psychological Approach to the Traffic Problem. Sci. Month. June, 1937, p. 547.

Ventilation, Comfort, and Health

—Under ordinary indoor conditions artificial humidification is unnecessary, says this sound report which will enable sanitarians to keep an even keel in the face of the gales of high-pressure sales promotion by commercial air conditioners. A fine, useful committee report.

YAGLOU, C. P. Physical and Physiologic Principles of Air Conditioning. J.A.M.A. 108, 20:1708 (May 15), 1937.

ASSOCIATION NEWS

PUBLICATION DATES FOR ANNUAL MEETING INFORMATION

July	Hotels, rates, reservation blank
August	Preliminary scientific program
	Scientific Trips
	Railroad rates from principal cities
September	Entertainment Plans

NO POST-CONVENTION TOUR THIS YEAR

THE Committee on Meetings and Publications announces regretfully that the plans for the projected post-convention tour to Bermuda under the auspices of the Association have been abandoned. It is the policy of the committee to organize group travel movements only when financial arrangements can be effected which are decidedly to the advantage of members, and when unusual professional and social opportunities are offered to a delegation which an individual would be unlikely to secure for himself. Neither of these factors is inherent in the proposals entertained by the committee for a tour to Bermuda following the New York City meeting.

IDENTIFICATION CERTIFICATES NOT REQUIRED

THERE will be no identification certificates for reduced railroad rates mailed to members of the Association this year. The blanket rate of 2¢ per mile in coaches and 3¢ per mile in Pullmans adopted throughout the United States in 1936 still maintains. It is a public tariff and no organization credentials are required to obtain it. Rates from various cities to New York will be published in the August *Journal*.

HEALTH EDUCATION INSTITUTE

REQUESTS for the program of the Fifth Health Education Institute have been numerous. Registration will be closed at the discretion of the Institute Committee. Prompt action is desirable if you wish to enroll in the Institute this year. The registration fee is $3.00 for members of the Association and $6.00 for non-members.

VITAL STATISTICS HEADQUARTERS

THE Vital Statistics Section and the American Association of State Registration Executives will make their headquarters at the Hotel McAlpin. A welcoming committee will be on hand

to introduce those people who do not know each other and to provide information about the interesting things planned for vital statisticians during the days of the 66th Annual Meeting.

CLOSING DATE FOR FELLOWSHIP APPLICATIONS

THE Committee on Fellowship and Membership wishes to announce that August 1 is the closing date for accepting Fellowship applications for action at the New York City Annual Meeting. Eligible members who desire to apply for Fellowship this year are requested to submit their applications to the committee as much in advance of August 1 as possible.

ERRATUM

In the article Nutritional Economics of Dietary Calcium, by Frank L. Gunderson, Ph.D., page 572 of the June *Journal*, the sentence starting in the middle of column 1, as follows: "The cost of natural foods . . ." should be changed to read:

The cost of natural foods bearing 1 gm. of calcium varies from a low of 6.4 cents for either evaporated milk or American cheese up to more than $2 for certain other foods.

APPLICANTS FOR MEMBERSHIP

The following individuals have applied for membership in the Association. They have requested affiliation with the sections indicated.

Health Officers Section

Norman L. Cook, M.D., 426 Park Ave., Waverly, N. Y., Acting Health Officer of Chemung County

Franklin L. Geiger, M.D., 320 E. Bridge St., St. Matthews, S. C., Director, District Health Dept.

Erwin R. Lochte, M.D., 1000 Medical Arts Bldg., San Antonio, Tex., Member, City Health Board

Harry D. McNeil, M.D., Department of Health, Bangor, Me., Health Officer

Howard E. Porter, City Hall, Quincy, Mass., Agent, Health Department

John J. Poutas, M.D., 145 State St., Springfield, Mass., State District Health Officer

Thomas B. Todd, M.D., Buckner Bldg., Nevada, Mo., Vernon County Health Officer

Charles R. Wylie, M.D., County Health Unit, Ventura, Calif., Ventura County Health Officer

Laboratory Section

Edward M. Butt, M.D., 3551 University Ave., Los Angeles, Calif., Bacteriologist and Pathologist for Santa Fe Railroad Hospital

George Jaggard, 2300 Locust St., Philadelphia, Pa., Manager, The Dairy Laboratories

Beatrice B. Potter, Gaylord Farm Sanatorium, Wallingford, Conn., Laboratory Worker

Charles R. Schroeder, D.V.M., New York Zoölogical Park, Bronx, N. Y., Veterinary Pathologist

Ernest C. Thompson, 1792 E. 22 St., Brooklyn, N. Y., Director of Laboratories, The Borden Co.

Vital Statistics Section

Carol C. Creighton, 1245 N. Commerce St., Stockton, Calif., Vital Statistician for San Joaquin County

Elizabeth Reed, State Dept. of Health, Albany, N. Y., Junior Statistician

Morton Robins, M.S.P.H., State Office Bldg., Albany, N. Y., Junior Statistician

Public Health Engineering Section

Graham M. Hatch, Jr., 202 City Hall Annex, Dallas, Tex., Sanitary Engineer, Health Dept.

LeVerne D. Hudson, 323 E. 4 St., Flora, Ill., Sanitary Engineer, District 21, State Dept. of Health

Kenneth C. Lauster, 309 S. 5th St., Grand Forks, N. D., District Supervisor, Community Sanitation, State Dept. of Health

R. H. Presley, 524 S. Fannin, Tyler, Tex., Sanitary Engineer, Tyler-Smith County Health Unit

A. Paul Troemper, State Health Dept., Springfield, Ill., District Sanitary Engineer, State Dept. of Public Health

William M. Wallace, B.S., Filtration Plant, Water Works Park, Detroit, Mich., Supt. of Filtration

Rudolph H. Weiss, 917 Water, Kerrville, Tex., District Sanitary Engineer, State Dept. of Health

Richard L. Woodward, Interstate Sanitary District No. 2, Washington, D. C., Junior Sanitary Engineer, U. S. Public Health Service

Industrial Hygiene Section

John H. Blauvelt, M.D., 80 Maiden Lane, New York, N. Y., Co-director of Laboratory of Industrial Hygiene and Toxicology, Fidelity and Casualty Co. of N. Y.

Alfred N. Setterlind, 7628 Colfax Ave., Chicago, Ill., Chemist, Division of Industrial Hygiene, State Dept. of Health

Herbert T. Walworth, Herman Kiefer Hospital, Detroit, Mich., Chemical Engineer, Bureau of Industrial Hygiene, Dept. of Health

Food and Nutrition Section

Jack G. Baker, 739 Fourth Ave., San Diego, Calif., Chief, Bureau of Foods and Drugs, Dept. of Public Health

Rubin Finkelstein, 19 West 106 St., New York, N. Y., Inspector of Foods, Dept. of Health

Hyman J. Kleinfeld, 1284 Sterling Place, Brooklyn, N. Y., Inspector of Foods, Dept. of Health

Child Hygiene Section

Clara B. Barrett, M.D., State Dept. of Health, Atlanta, Ga., Pediatrician, Child Health Demonstration

Myron E. Wegman, M.D., 2411 N. Charles St., Baltimore, Md., Pediatric Consultant, Bureau of Child Hygiene, State Dept. of Health

Public Health Education Section

Mrs. Aimee Biering, 122 Biering, San Antonio, Tex., Secretary to Health Officer, City Health Dept.

Ewing P. Brady, D.D.S., 7239 Northmoor Drive, St. Louis, Mo., Supervisor, Health Education, Board of Education

Robert L. Breeden, 94 Knoles Way, Stockton, Calif., Director, Physical Education, College of the Pacific

Alfred R. Heath, 30 Rockefeller Plaza, New York, N. Y., Director, Field Service, Public Health Committee of the Cup and Container Institute

Carl O. Lathrop, Ph.D., 429 Bewley Bldg., Lockport, N. Y., Executive Secretary, Niagara County Health Assn.

Frances R. Pratt, 216 Forest Rd., Raleigh, N. C., Special Field Nurse, N. C. Maternal Health League, and State Board of Health

Otto J. Potthast, M.D., 314 Medical Arts Bldg., San Antonio, Tex., Member, City Board of Health

Public Health Nursing Section

Edna B. Ebright, Box 142, Niles, Calif., Public Health Nurse, Alameda County Health Dept.

Edna C. Harrington, Board of Health, Honolulu, T. H., Staff Nurse

Leah M. Keable, 115 Court House, Duluth, Minn., Supervisor of Nurses, Arrowhead Public Health Unit

Cynthia M. Mabbette, State Board of Health, Ocala, Fla., District Supervisor of Nurses

Virginia L. Stockard, R.N., 1303 W. High St., Jefferson City, Mo., Field Advisory Nurse

Epidemiology Section

Dr. Dario Curiel, State Health Dept., Louisville, Ky., At present—student, Johns Hopkins School of Hygiene and Public Health, Baltimore, Md.

Gordon R. Gray, M.D., C.P.H., 268 Guy Park Ave., Amsterdam, N. Y., Assistant Epidemiologist, State Dept. of Health

Dr. A. L. Briceno Rossi, Este 4 No. 145, Caracas, Venezuela, S. A., Head of Epidemiology Service, Dept. of Health

Unaffiliated

Leon Adler, Mooresville, Ind., Manager, National Motion Pictures Company

Edward A. Bogdan, M.D., 48 Church St., Amsterdam, N. Y., Consultant, Syphilis Clinic, Health Dept.

A. B. Fitzgerald, M.D., Box 22, North Creek, N. Y., Taking Health Officers course

John G. Grant, M.D., College Hospital, Ames, Ia., Professor and Head, Dept. of Hygiene and Student Health Service, Iowa State College

John F. Southwell, M.D., 287 State St., Albany, N. Y., Clinician, Social Hygiene Clinic, Memorial Hospital

SIXTY-SIXTH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION

New York, N. Y.
October 5–8, 1937

NEW YORK HOTELS

THE three headquarters hotels are: The Pennsylvania, The New Yorker, and The McAlpin. The rates at these hotels are given below; rates of other New York hotels will be sent to you upon request to the Association.

It is urged that you make your reservation early, and use the Reservation Blank supplied herewith.

		Rate per Day				
	Room Capacity	*Single Room*	*Double Bedded Room*	*Twin Bedded Room*	*Suite for One*	*Suite for Two*
Pennsylvania	2,000	$3.50 up	$5.00 up	$6.00 up	$11.00 up	$13.00 up
New Yorker	2,500	3.50	5.00	6.00		
McAlpin	1,300	2.50 up	4.00 up	4.50 up	8.00 up	10.00 up

.....(Cut off on this line and mail to the hotel of your choice).....

HOTEL RESERVATION BLANK FOR NEW YORK MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
50 WEST 50TH STREET, NEW YORK, N. Y.
OCTOBER 5–8, 1937

To .....
(Name of Hotel)

Please reserve for me ..... rooms for ..... persons for the A.P.H.A. Meeting.

Single room ..... Double room .....

Maximum rate per day for room $..... Minimum rate per day for room $.....

I expect to arrive ..... If date of arrival is changed I will notify you at least 24 hours in advance.

Please acknowledge this reservation.

Name .....

Street address .....

City ..... State .....

NEWS FROM THE FIELD

HEATING AND VENTILATING EXPOSITION

THE Fifth International Heating and Ventilating Exposition will be held at Grand Central Palace, in New York City, January 24–28, 1938. Since its inception in 1930, the Heating and Ventilating Exposition has been held every two years. The first showing was in Philadelphia, the second in Cleveland, the third in New York City, and the fourth, which took place in 1936, was held in Chicago. Each successive Exposition has met with an increasingly active response, both on the part of exhibitors and audience.

Perfect weather indoors the year round will be a theme of the Fifth Exposition.

SCHOOL EXHIBIT

THE Fifth Annual Summer School Exhibit, sponsored by the School of Education of New York University, will have projects and other materials from public and private schools on display from July 5th to 21st on the main floor of the Brown Building, Washington Place, New York.

FRANKLIN INSTITUTE

AFTER a century, The Franklin Institute is now occupying its new building. The address is: Parkway at 20th Street, Philadelphia, Pa.

MISSOURI PUBLIC HEALTH ASSOCIATION

THE Missouri Public Health Association, affiliated with the American Public Health Association since 1928, held an interesting and well attended Annual Meeting on April 29 and 30, in Springfield, Mo.

Edwin Henry Schorer, M.D.,† was inducted into office as President of the Association and Merl P. Moon, Ph.D.,* of the Medical Department of the University of Missouri, was named President-elect.

NEW HEALTH UNITS IN QUEBEC

Hon. Albini Paquette, Provincial Secretary and Minister of Health of Quebec, announced recently the creation of 3 new health units: in Three Rivers, Arthabaska, Brome-Missisquoi, which will be ready to operate in July.

PERSONALS

DR. REUBEN A. BROWN, of the Alabama State Department of Health, has been appointed Director of Tuberculosis Control of the Louisiana State Department of Health.

DR. LEONCIO LOPEZ-RIZAL, Chief of the Administrative Division of the Bureau of Health of the Philippines, retired February 10, after 25 years in the government service.

DR. ABRAHAM I. PERLEY, of Coleanor, Ala., has been appointed Health Officer of Chambers County, Ala., succeeding DR. CHESTER E. JOHNSON, JR., resigned.

DR. DAVID M. PARKER, formerly a physician in the CCC, has been appointed Health Officer of Virginia, to succeed DR. JOHN A. MALMSTROM, resigned.

DR. JOHN W. TAPPAN, of El Paso, Tex., has been appointed Health Officer of the El Paso City and County Health Unit, succeeding DR. THOMAS J. MCCAMANT.†

REUBEN T. CRAWFORD, D.D.S., of Montgomery, Ala., has been placed in charge of the reinstated Division of Oral Hygiene of the Bureau of Hygiene and Nursing of the Alabama State Department of Health.

* Fellow A.P.H.A.
† Member A.P.H.A.

DR. JAMES FENTON, the Medical Officer of Health for the Royal Borough of Kensington (London, England), has been elected President of the Society of Medical Officers of Health. Dr. Fenton is the Chairman of the Central Council for Health Education, a past Chairman of the Royal Sanitary Institute, and an Honorary Fellow of the American Public Health Association.

ALTON S. POPE, M.D.,* recently Director of the Division of Tuberculosis of the State of Massachusetts, has been appointed Deputy Commissioner of Public Health, succeeding GAYLORD W. ANDERSON, M.D.*

STEWART G. THOMPSON, D.P.H.,* recently State Registrar in Florida, has resigned to become Managing Director of the Florida Medical Association. Dr. Thompson is Secretary of the Florida Public Health Association.

A. J. DOUGLAS, M.D.,* Medical Health Officer of Winnipeg, Manitoba, was recently honored with the degree of LL.D. upon the 60th Anniversary of the founding of the University of Manitoba.

DR. EDWIN M. IRELAND, of Coats, Kans., has been appointed Health Officer of Pratt County, succeeding DR. CHARLES E. PHILLIPS.

ROY R. JONES, M.D.,† Passed Assistant Surgeon of the U. S. Public Health Service, assigned to the division of labor standards of the U. S. Department of Labor, and DR. LEGRANGE B. BYINGTON, Surgeon, U. S. Public Health Service, in charge of the Baltimore Quarantine Station at Curtis Bay, Md., have been appointed members of the advisory committee on sanitation of the Baltimore City Health Department.

DR. E. BRIGHT WILSON, JR.,† an assistant professor of chemistry at Harvard University, will receive the 1937 prize of $1,000 awarded by the American Chemical Society in recognition of his experimental work in chemistry. Formal presentation will be made at the Society's 94th meeting in Rochester, N. Y., September 6–10.

THORVALD MADSEN, M.D., Director of the State Serum Institute, Copenhagen, Denmark, has for the seventh time been elected President of the Health Committee of the League of Nations. He is an Honorary Fellow of the A.P.H.A.

SIR FREDERICK GOWLAND HOPKINS, Professor of Biochemistry at the University of Cambridge, has been awarded the Harben Gold Medal by the council of the British Royal Institute of Public Health.

ROY F. FEEMSTER, M.D., DR.P.H.,* formerly Assistant Director of the Antitoxin and Vaccine Laboratory, has been appointed Director of the Division of Communicable Diseases in the Massachusetts State Department of Public Health.

DR. HOLLAND THOMPSON, formerly of the Maybury Sanatorium, Northville, Mich. (Detroit Municipal Tuberculosis Hospital), has been appointed Tuberculosis Clinician of Alabama State Department of Health.

EDWIN B. GODFREY, M.D.,† Health Officer of San Bernardino, Calif., has been appointed State Health Officer of New Mexico, to succeed JOHN ROSSLYN EARP, DR.P.H.,* resigned.

CARL N. NEUPERT, M.D.,† of Janesville, Wis., has been appointed Assistant State Health Officer of Wisconsin, succeeding DR. ETHAN B. PFEFFERKORN, of Oshkosh, resigned.

DR. WILLIAM J. CRAIG, of Shreveport, La., has been named Health Officer of Lawrence County, Ala.

PROFESSOR J. K. GEE, Superintendent

* Fellow A.P.H.A.
† Member A.P.H.A.

of the Woodbine Public Schools, has been appointed in charge of health education work at the Iowa State Department of Health, Des Moines.

HOWARD G. STEVENS, M.D., has been appointed Health Officer of New Milford, Conn., to fill the vacancy caused by the resignation of F. E. KING, M.D., and also Health Officer of the town of Bridgewater, to fill the vacancy caused by the death of MARY G. HASKINS, M.D.

DR. ELSWORTH L. GARDNER, of Portland, Ore., has been appointed Health Officer of Lane County, succeeding ALSTRUP N. JOHNSON, M.D.,† resigned.

DR. STEWART G. PATTON, of North Jackson, Ohio, has been appointed Health Officer of Mahoning County, to succeed GEORGE Y. DAVIS, M.D.,† of Youngstown.

DR. JOSEPH C. TATUM, of Waverly, Tenn., has resigned as Health Officer of Humphreys County, to become Health Officer of Giles County, succeeding JOHN U. SPEAR, M.D.,† of Pulaski.

J. CARROLL MONTGOMERY, M.D.,† of Wichita, Kans., has been appointed Health Officer of Sedgwick County.

DR. ALFRED E. EYRES, recently on the staff of the Health Department of Seattle, Wash., has been appointed Health Officer of Walla Walla, and Walla Walla County.

DR. MARION H. SEAWELL, of Jackson, N. C., has resigned as Health Officer of Northampton County.

DR. WALTER RALEIGH PARKER, of Woodland, N. C., has been appointed Health Officer of Northampton County, to succeed DR. MARION H. SEAWELL, of Jackson, resigned.

DR. WAYLAND N. MCKENZIE, of Albemarle, N. C., has been chosen to head a new health department in Stanly County to be opened in July.

DR. HAROLD C. WHIMS, of Waxhaw, N. C., has succeeded ROBERT M. BARDIN, M.D.,† of Rutherfordton, N. C., as Health Officer of Rutherford County.

DR. EUGENE E. HAMILTON, of New Leipzig, N. D., has been appointed Health Officer of Grant County, to succeed DR. LEONARD B. MOYER.

DR. ALBERT L. DAVENPORT, of Holdenville, Okla., has been appointed Health Officer of Hughes County, to succeed DR. CHARLES S. WALLACE.

DR. WILLIAM C. TREDER, of Scotia, N. Y., has been appointed Health Officer of Schenectady County.

DR. MURRAY P. WHICHARD, of Edenton, N. C., has been appointed Health Officer of Chowan County.

DR. CHARLES H. PEETE, of Warrenton, N. C., has been appointed Health Officer of Warren County.

DR. JOHN S. ANDERSON, of New Bern, N. C., has been appointed Health Officer of Craven County.

DR. EARL L. WHITE, U. S. Public Health Service, has been appointed Health Officer of Crittenden County, with headquarters at Marion, Ky.

DR. HERBERT E. KOEPKE, of Cadiz, Ohio, has been appointed Health Commissioner of Harrison County.

DR. WILLIAM EDWARD BLAIR, of Lebanon, Ohio, has been appointed Health Commissioner of Warren County.

DR. WILLIAM K. FAST, of Atchison, Kans., has been appointed Health Officer of Atchison County.

DR. FRED L. HOLCOMB, of Coldwater, Kans., has been appointed Health Officer of Comanche County.

DR. WILLIAM S. GOOCH, of Fort Scott, Kans., has been appointed Health Officer of Bourbon County.

DR. LAWRENCE F. SCHUHMACHER, JR., of Meade, Kans., has been appointed Health Officer of Meade County.

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* Fellow A.P.H.A.
† Member A.P.H.A.

DEATH

HARRY GARLAND TIMBRES, M.D., DR.P.H.,† died of typhus fever on May 12, in Marbumstroy, Russia, where he was engaged in malarial research for the Russian Government. Dr. Timbres, who was a graduate of Johns Hopkins Medical School and the School of Hygiene and Public Health, was formerly an assistant in biostatistics at Johns Hopkins and had previously served in India as a Health Officer.

CONFERENCES

American Association of School Physicians. Annual Meeting in conjunction with Annual Meeting of the American Public Health Association. Hotel Pennsylvania, New York, N. Y. October 5–8.

American College of Surgeons. Chicago, Ill. October 25–29.

American Dietetic Association—Twentieth Annual Meeting. John Marshall Hotel, Richmond, Va. October 18–21.

American Hospital Association. Atlantic City, N. J. September 13–17.

American Public Health Association —Sixty-sixth Annual Meeting. New York, N. Y. October 5–8.

Association of Dairy, Food and Drug Officials of the United States. Raleigh Hotel, Washington, D. C. October 26–29.

Fifth International Congress of Radiology. Chicago, Ill. Sept. 13–17.

International Association of Milk Dealers. Dallas, Tex. Oct. 21–23.

International Association of Milk Sanitarians. Brown Hotel, Louisville, Ky. October 11–13.

Michigan Public Health Association. Lansing, Mich. November 10–12.

New England Milk Producers Association. Boston, Mass. October 26–27.

New York State Association of Dairy and Milk Inspectors. Hotel Utica, Utica, N. Y. September 22–24.

New York State Conference on Social Work. New York, N. Y. October 19–22.

Ontario Hospital Association. Toronto, Ont. October 21–23.

Rocky Mountain Medical Conference. Denver, Colo. July 19–21.

Southern Medical Association. New Orleans, La. November 28.

FOREIGN

International Congress of Medicine Applied to Physical Education. Paris. July 11–17.

International Congress of Public Health Work. Paris. July 12–16.

Health Congress of The Royal Sanitary Institute. Birmingham, England. July 12–17.

Second International Congress of Sanatoria and Private Nursing Homes. Paris. July 12–17.

Fourth International Congress of Compared Psychotherapy and Psychology. Paris. July 16–18.

Second International Congress of Mental Hygiene. Paris. July 19–23.

British Medical Association. Belfast, Ireland. July 20–25.

Congress of Infant Psychiatry. Paris. July 25–28.

British Dental Association. Cambridge, England. July 30–August 3.

Seventh Biennial Conference, Health Section of the World Federation of Education Associations. Tokyo, Japan. August 2–7.

World Congress of Universal Documentation. Paris. August 16–21.

International Union Against Tuberculosis. Lisbon, Portugal. September 5–9.

Fourth International Pediatric Congress. Rome, Italy. Sept. 24–30.

Second International Congress for the Protection of Infancy. Rome, Italy. October 4–8.

Congress of Physiologists. Paris. October 11–13.